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AMERICAN TEXT BOOKS OF ART EDUCATION

BY
WALTER SMITH
STATE DIRECTOR
OF
ART EDUCATION
FOR
MASSACHUSETTS

NUMBER

ONE

INTERMEDIATE COURSE

L. PRANG & COMPANY
BOSTON

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May 14, 1878

FREEHAND DRAWING FROM FLAT COPIES.

GENERAL DIRECTIONS FOR TEACHER AND PUPIL.

FOR THE TEACHER.

I. YOU will usually find it best to take personal charge, between lessons, of the drawing-books, pencils, and rubbers. Do not consume, at a lesson, more than one minute in their distribution or collection.

II. Before the class begin to draw any copy which their books contain, require them to look at it carefully while you give the directions, as set forth in the Manual, for drawing it. Have them repeat the directions until you are certain they understand the different steps to be taken. Occasionally require the class, before drawing a form, to analyze it, as described in the Manual.

III. See that the whole class work together, as a rule, doing the same thing at the same time. By the aid of the blackboard you can keep all together. But do not spend at the blackboard, on an average, more than one tenth of the time devoted to the lesson. Give the other nine tenths to individual instruction.

IV. See that the learner always draws, *First*, with understanding; *Second*, with rapidity; *Third*, with as much precision as rapid drawing will admit. Do not make fine finish the leading feature; at least, do not sacrifice to this either knowledge or celerity of execution.

V. Blackboard, dictation, and memory lessons, with original design, are leading features in this course of drawing. It is for these that the blank pages are inserted. For specific directions see the Manual.

FOR THE PUPIL.

To insure accuracy and to avoid loss of time, proceed thus with each exercise; *First*, draw the construction or guide lines, which are usually dotted in the printed copy; *Second*, sketch the longer lines of the form, or object, and then the shorter ones; *Third*, line in, that is, finish, the complete form.

The First Stage.

DRAWING THE GUIDE LINES. — To secure a correct final result you must both accurately place a and accurately divide these lines. Do not dot them as in the printed copies, but make them continuous and faint. Do not attempt to draw the form without these lines.

The Second Stage.

SKETCHING THE FORM. — After the guide lines have been drawn, sketch the form; that is, draw it in light line, the lighter the better, in order that errors may be easily corrected. Turn the book for the detection of errors.

The Third Stage.

LINING IN. — Erase the guide lines, and all other lines and parts of lines which are not to appear in the finished drawing; partly erase the sketch of the form, as it is to appear when lined in, making the lines just visible; clean the paper. The work is now ready for finishing or lining in. The pencil should have a sharp point; and it should be held more nearly upright than in sketching, that the side of the pencil may not touch the paper. Make a firm, bold line, and of the same thickness throughout, unless there is a difference in the copy.

General Remarks.

POSITION OF BOOK. — Place the book so that you can most easily draw the exercise or any part of it. The following will be found the best general rules; for Stage 1 keep the book square with the edges of the desk, that the horizontal and vertical lines may be the more accurately drawn. For Stages 2 and 3 keep the book as far as possible in the same position as in Stage 1. By turning the hand and pencil you will frequently avoid the necessity of turning the book.

DRAWING CURVES. — For a long, flat curve, make the wrist the centre from which the curve is struck; draw short, round curves with the fingers alone. See that the curve, when you are drawing it, is concave towards the fingers; if it is convex towards the fingers, then turn the book.

PENCIL, RUBBER, ETC. — Keep your pencil point in good condition by rubbing it sidewise on a piece of paper. Do not wet the point, lest it make lines too black and difficult to erase. Do not hold the rubber in the hand while you are using the pencil, lest it become moist. Use the rubber sparingly in Stages 1 and 2. Before beginning Stage 3 you may use it freely, for your drawing should not be spoiled by imperfectly erased faults. Do not measure the drawing without permission of the teacher. Work rapidly, yet always avoid the haste that is heedless. Be patient, industrious, careful, persevering, and you will certainly succeed.

PRINCIPLES OF DESIGN ILLUSTRATED IN THIS BOOK.

I. BEAUTY RESULTING FROM SUBLTY.

1. A subtle proportion is more pleasing than a simple proportion. Thus the proportion 2 to 3 is more pleasing than the proportion 1 to 2; and 3 to 5 is more pleasing than 2 to 3. It is more difficult for the eye to detect a subtle proportion than a simple one. Both the ornament and the form of the object should have a distinct proportion.

2. A subtle curve is more pleasing than a simple curve. Thus an elliptical curve is more beautiful than a circular curve. The character of the latter is more readily detected by the eye. If the two segments of a reversed curve are parts of a circle, the curve is less beautiful than one whose change of direction is gradual and not all at one point.

3. A tangential union of curves, or of curves and straight lines, is more pleasing than a secant, abrupt union. In the former case one line blends insensibly into the other; but in the latter case the junction is strongly marked. For agreeable effect there must be no abrupt change in the direction of a line.

II. BEAUTY RESULTING FROM ORDERLY ARRANGEMENT.

1. Orderly arrangement is secured by symmetrical repetition about a centre, as of a circle, a triangle, a square, a pentagon. This form of repetition requires that all parts of the figure having the same relation to the centre should be treated exactly alike. Thus there can be no line without its companions; no superfluous line, as there would be in a disorderly arrangement.

2. Orderly arrangement is secured by symmetrical repetition on an axis. This form of repetition requires that there be a perfect balance of parts, that the right-hand side of the figure correspond exactly to the left-hand. A violation of this law of ornament produces always a disagreeable effect.

3. Orderly arrangement is secured by a regular repetition of the symmetrical unit, or repeat. This repetition may be made horizontally or vertically, as in the case of mouldings on a wall; or it may be made in all directions, as in a design for a carpet or for the decoration of a ceiling. This orderly repetition of an ornament usually gives an increase of beauty, while a disorderly arrangement would be exceedingly disagreeable.

III. ADAPTATION OF THE DESIGN TO POSITION.

1. When a design is to be viewed from all sides, as an ornament on a ceiling or a carpet pattern, it should be so constructed that it will always be seen right way up. With symmetrical arrangement about a centre this always happens.

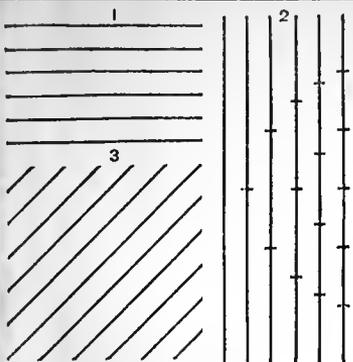
2. When a design is to be viewed from only one side, as in the case of an ornament on the wall of a room, it will be seen right way up, whether the arrangement be around a centre or on an axis, provided the axis is vertical. This position of the axis must be maintained, whether the unit is repeated up and down or right and left.

IV. ADAPTATION OF THE DESIGN TO MATERIAL AND USE.

1. Due regard must always be paid to the material of which the object is to be made, or to which the ornament is to be applied. A design for an object to be made of metal will not necessarily answer for a similar object to be made of clay. If an ornament is to be cut in granite, for example, the lines must be few; if engraved on silver, the ornament may be elaborate.

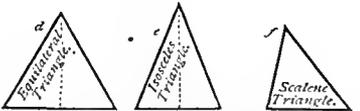
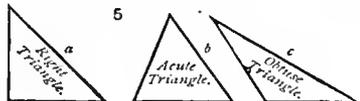
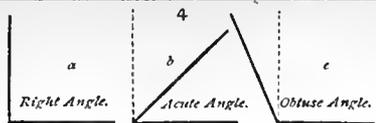
2. The use to which an object is to be put must be first considered in determining its form. To this form the decoration, if there is any, must be adapted. It should also be in harmony with the use. The form of an object is not to be adapted to its decoration.

Nearly all the designs in this book are geometrical, being combinations of straight and curved lines without an attempt to represent objects, natural or artificial. A few are outline designs for vases, pitchers, and the like. There are no conventional forms. The Manual gives full explanation of the principles, and it is expected that the teacher will explain them to his pupils as they advance with the drawings. When they have concluded the book, they should be able to give an account of these principles and to illustrate them with original designs.



STRAIGHT LINES.

1. — For Horizontal Lines, lengthened.



ANGLES AND TRIANGLES.

2. — For Vertical Lines, lengthened.

4 a. — For Right Angle, sides lengthened.

4 b. — For Acute Angle, sides lengthened.

4 c. — For Obtuse Angle, sides lengthened.

5 a. — For Right Triangle, enlarged.

5 b. — For Acute Triangle, enlarged.

5 c. — For Obtuse Triangle, enlarged.

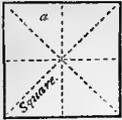
3. — For Oblique Lines, lengthened.

5 d. — For Equilateral Triangle, enlarged.

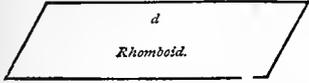
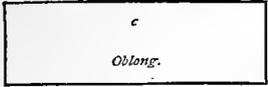
5 e. — For Isosceles Triangle, enlarged.

5 f. — For Scalene Triangle, enlarged.

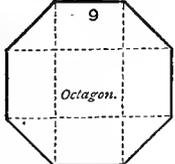
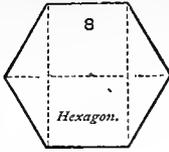
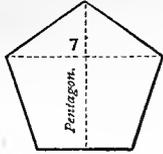
By practice, make yourself able to draw and define, without hesitation, all the figures on this page.



6



QUADRILATERALS.



POLYGONS.

7. — For Pentagon, enlarged,

8. — For Hexagon, enlarged.

6 a. — For Square, enlarged.

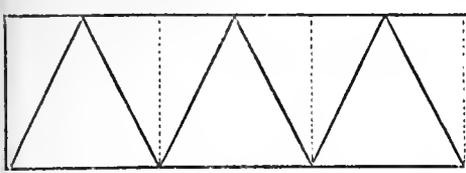
6 b. — For Rhombus, enlarged.

9. — For Octagon, enlarged.

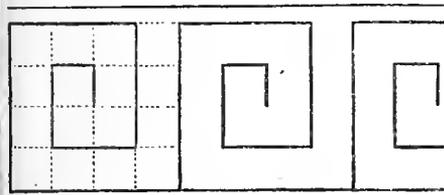
6 c. — For two Oblongs, enlarged.

6 d. — For two Rhomboids, enlarged.

BORDERS AND MOULDINGS, TO BE COMPLETED. HORIZONTAL REPETITION.



10. — Zigzag.

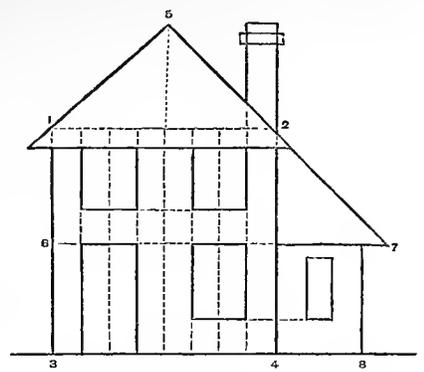


11. — Greek Fret.



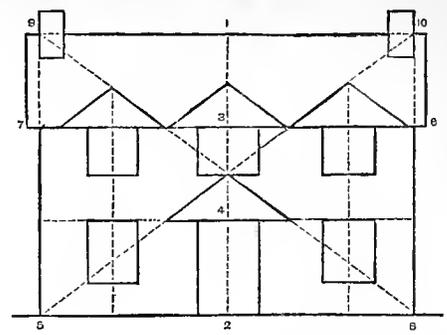
12. — Isosceles Triangles, alternately reversed.

13



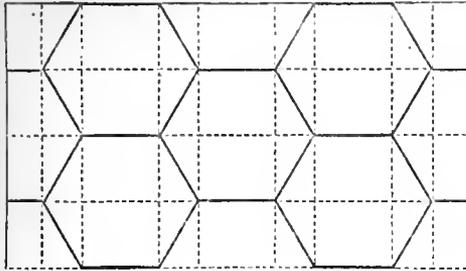
13. — Toy House, end elevation, to be enlarged.

14

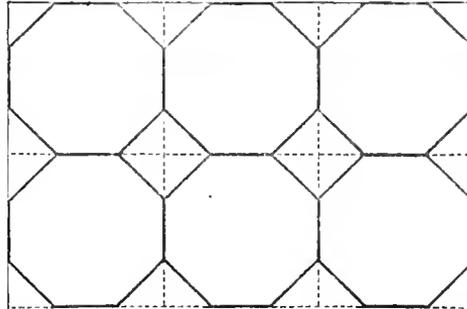


14. — Toy House, side elevation, to be enlarged.

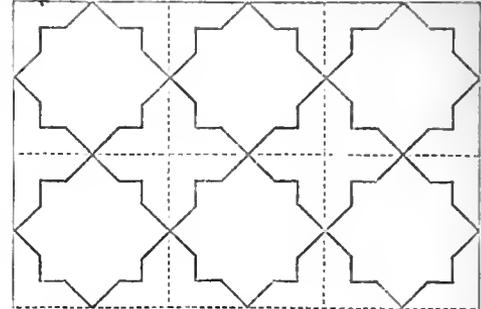
15. — Hexagons, repeated to cover surface.

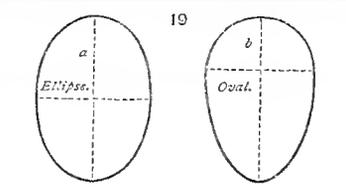
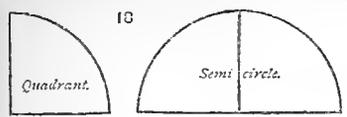


16. — Octagons and Squares, repeated to cover surface.



17. — Double Squares and Crosses, repeated to cover surface.





CIRCLE AND PARTS.

ELLIPSES AND OVAL.

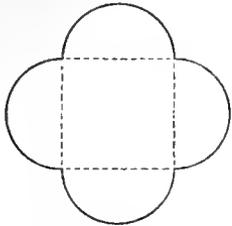
18. — Circle and its parts, to be enlarged.

19 a. — Ellipse, enlarged.

19 b. — Oval, enlarged.

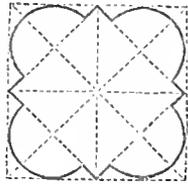
19 c. — Ellipse, enlarged.

20



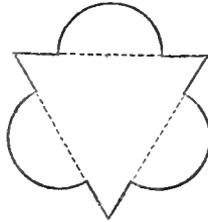
QUATREFOIL.

21



QUATREFOIL.

22



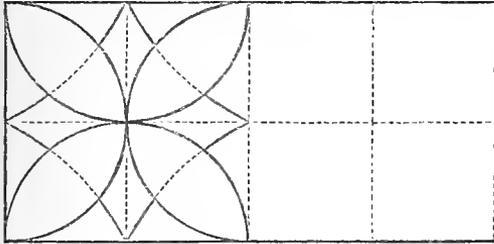
TREFOIL.

20. — For Quatrefoil, to be enlarged and filled with a design.

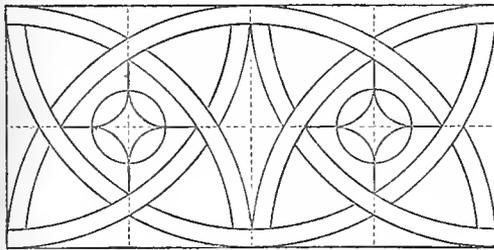
21. — For Quatrefoil, to be enlarged and filled.

22. — For Trefoil, to be enlarged and filled.

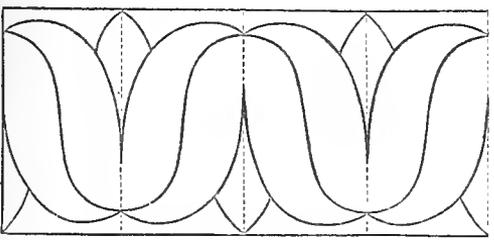
BORDERS AND MOULDINGS TO BE COMPLETED.



23. — Circular Curves.



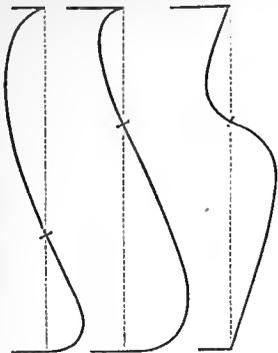
24. — Circular Curves, interlacing.



25. — Flower Forms, alternately reversed.

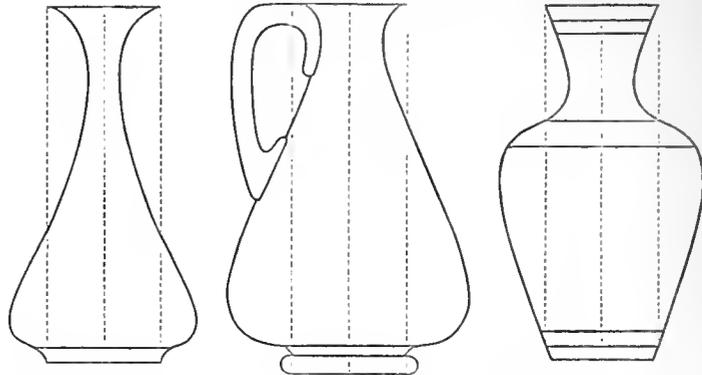
As a rule, draw the longest lines of a figure first. Thus, in the last figure above, draw the continuous wave-curve, which extends from left to right, before drawing any of the shorter curves.

26. — Reversed Curves.



26. — For Reversed Curves.

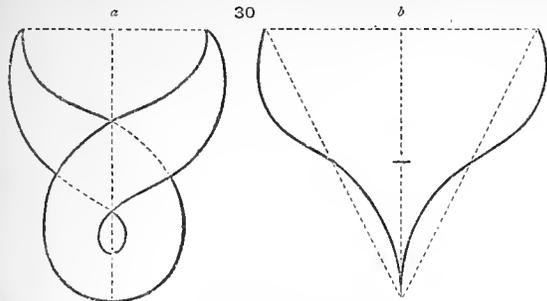
REVERSED CURVES, APPLIED.



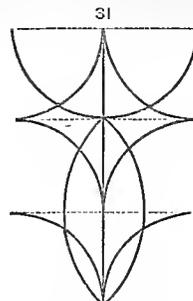
27. — For Vaso, enlarged.

28. — For Pitcher, enlarged.

29. — For Vaso, enlarged.

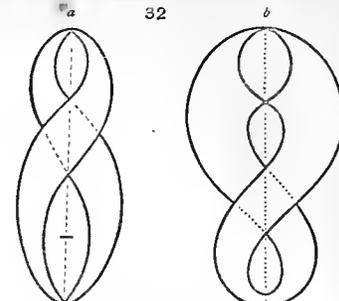


ABSTRACT CURVES.

For Curves *a* or *b*, enlarged.

ABSTRACT CURVES.

For Curves 31, enlarged.

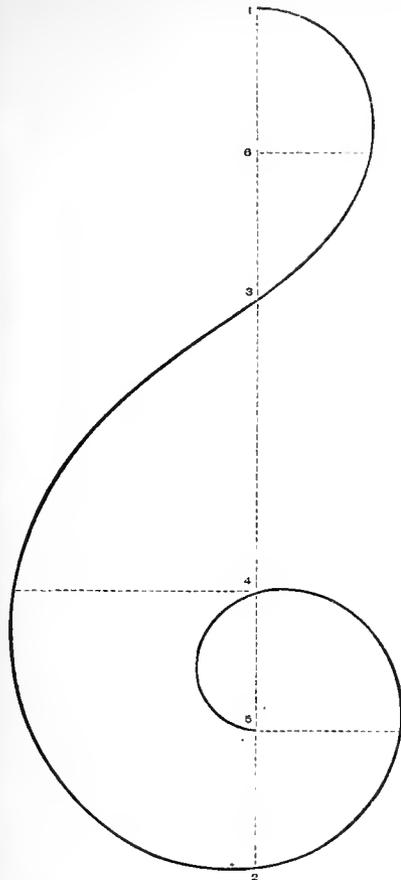


ABSTRACT CURVES.

For Curves *a* or *b*, enlarged.

To fill the left-hand two thirds of this page, draw from memory, Ex. 20, 21, or 22, with added design. In the upper part of the right-hand third make an original design; write the description below it.

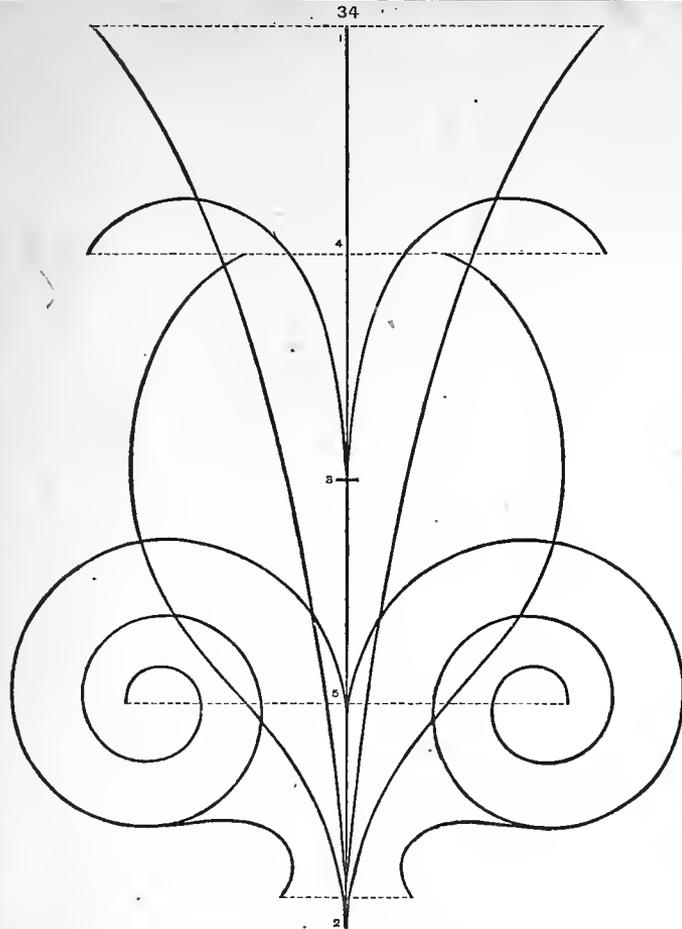
33. Spiral Form.



33.—Spiral Form, same size.

33.—Spiral Form, same size, sides reversed.

34—For Abstract Curves, same size.



ABSTRACT CURVES.

Observe that the union of the curves with the straight line at 2 and 3 is tangential; at 5, secant or cutting. Observe that the former is much the more pleasing. Describe the principles of design exemplified in this book.

DEFINITIONS.

Before the pupil lays aside this book he should have a clear understanding of the definitions which follow. They should be learned and frequently reviewed in connection with the drawing-lessons. The Manual contains much more relating to the same.

I. A **POINT** is position only; therefore it has no length, breadth, or thickness.

NOTE.—In drawing, a point is represented by a dot, which has size.

II. A **LINE** has length, but no breadth or thickness.

NOTE.—In drawing, a line is represented by a pencil-mark, which has breadth.

1. **Lines named from their appearance** are straight, curved, or broken; or continuous or discontinuous.

a. A *Straight Line* has the same direction throughout its whole length.

b. A *Curved Line* constantly changes its direction; it has no three consecutive points in a straight line.

c. A *Broken Line* consists of a series of straight lines united one to the end of another, but having different directions.

d. A *Continuous Line* is an uninterrupted line; it may be either straight or curved.

e. A *Discontinuous Line* is a line which is interrupted at intervals; it may be either straight or curved.

2. **Straight Lines named from their position** are horizontal, vertical, or oblique.

NOTE.—The absolute position of a line is determined by its relation to the centre of the earth. In drawing, however, the surface on which the line is drawn is also taken into consideration. The surface is usually regarded as an upright plane; and the definitions here given conform to this view.

a. A *Horizontal Line* is a straight line which inclines neither up nor down.

b. A *Vertical Line* is a straight line which extends up and down and does not incline in any direction.

c. An *Oblique Line* is a straight line which inclines more or less.

NOTE.—The drawing-book must be regarded as in a vertical position, like the blackboard on the wall of the room. Hence a horizontal line in the book has the same direction as the upper edge of the book; a vertical line, the same direction as the right-hand edge; and a straight line drawn in any other direction is oblique.

3. **Lines named from their relation to one another** are perpendicular, oblique, or parallel.

a. A *Perpendicular Line*. One straight line is said to be perpendicular to another straight line, when the two form a right angle.

NOTE.—When we simply say of a line that it is perpendicular, we mean that it is vertical; but when we say that it is perpendicular to another line, it may be vertical, horizontal, or oblique, if its position is considered.

b. An *Oblique Line*. One straight line is said to be oblique to another straight line, when the two do not form a right angle.

c. *Parallel Lines*. Two lines, straight or curved, are said to be parallel when they lie side by side and have the same direction throughout their whole length.

NOTE.—Geometry knows nothing of lines except in their relation to one another, since it knows nothing of up and down, of right and left.

III. **SURFACE**. Space enclosed by lines is called surface; it has, therefore, length and breadth, but no thickness.

1. A *Plane*. Surface to all parts of which a rule can be exactly applied, is called a plane.

2. *Curved Surface*. When a surface curves like the outside of a cup, it is called convex; when it curves like the inside of a cup, it is called concave.

IV. A **SOLID**. Space enclosed by surfaces is called a solid; a solid has length, breadth, and thickness.

NOTE.—Thus we have, 1. a point,—no dimension; 2. a line,—one dimension; 3. a surface,—two dimensions; 4. a solid,—three dimensions. Solid here means quantity, or volume.

V. An **ANGLE** is the difference in direction of two straight lines which meet or only tend towards each other.

NOTE.—The word angle is often applied to the point where the lines meet,—the vertex of the angle.

1. **Different Angles**. When two straight lines cross each other so as to form four equal angles, as a vertical and a horizontal line would, each is called a right angle. An acute angle is smaller than a right angle; an obtuse angle is larger than a right angle.

NOTE.—The size of an angle depends, not on the length of the lines, but on the difference in their direction.

VI. A **TRIANGLE**. Any plane surface or figure bounded by three straight lines, or sides, is called a triangle.

1. **Different Triangles**. A *Right Triangle* contains a right angle. An *Equilateral Triangle* has three equal sides. An *Isosceles Triangle* has two of its sides equal. A *Scalene Triangle* has no two of its sides equal, and contains no right angle.

2. **Similar and Equal Triangles**. Two triangles, or any two plane figures, are said to be similar, when they have the same shape; equal, when they have the same area or surface.

3. An **Axis of Symmetry** is a line that divides a figure into two similar and equal parts, which balance each other without change of position. An isosceles triangle has one axis of symmetry; an equilateral, three.

VII. A **QUADRILATERAL**. Any plane surface or figure bounded by four straight sides is called a quadrilateral.

1. A **Square** has four equal straight sides and four equal angles.

a. A *Diameter of a Square* is a straight line drawn through the centre of the square, parallel to two of its sides.

NOTE.—This line is much used in drawing, and is so called for want of a better term.

b. A *Diagonal of a Square* is a straight line connecting opposite angles, or corners of the square.

2. **Other Quadrilaterals**. A *Rhombus* has four equal sides, but unequal angles. An *Oblong* has four equal angles, but only its opposite sides are equal. A *Rhomboid* has only opposite sides and opposite angles equal.

NOTE.—When a quadrilateral has four right angles, it is sometimes called a *Rectangle*; when it has its opposite sides parallel it is sometimes called a *Parallelogram*.

VIII. A **POLYGON**. Any plane figure bounded by more than four straight sides, and having more than four angles, is called a polygon, which means having many angles.

NOTE.—If the sides and angles are equal, the figure is called a regular polygon; if they are unequal, then it is called an irregular polygon. Polygons have different names, as pentagon, hexagon, etc.

1. A **Regular Pentagon** has five equal straight sides and five equal angles.

2. A **Regular Hexagon** has six equal straight sides and six equal angles.

3. A **Regular Octagon** has eight equal straight sides and eight equal angles.

NOTE.—The regular pentagon has five axes of symmetry; the regular hexagon, six; the regular octagon, eight.

IX. **CURVED LINES and CURVED FIGURES**. A line which constantly changes its direction, and has no three consecutive points in the same straight line, is called a curve; and any figure bounded by such a line is called a curved figure.

1. **Circular Curve and Circumference**. A circular curve is drawn in one plane and bends equally in all its parts; if continued far enough, the two ends unite, and it becomes a circumference.

2. A **Circle** is a plane figure bounded by a curve, called the circumference, all parts of which are at the same distance from a point within, called the centre.

NOTE.—The word circle is frequently used to denote the circumference as well as the space enclosed by it.

a. The *Radius of a Circle* is a straight line drawn from the centre to the circumference.

b. The *Diameter of a Circle* is a straight line drawn through the centre and touching the circumference on both sides.

c. **OTHER PARTS OF A CIRCLE**. A *Sector* is the space included between any part of the circumference and two radii of a circle. A *Quadrant* is the space included between a quarter of the circumference and two radii of a circle. An *Arc* is any part of the circumference of a circle.

A *Chord* is a straight line connecting the two ends of an arc. A *Segment* is the space included between an arc and its chord.

d. The *Altitude of a Curve* is the perpendicular distance from its base, or chord, to the highest point in the curve.

3. An **Ellipse** is a plane figure bounded by a curve, every point of which is at the same combined distance from two points called the foci.

NOTE.—The ellipse is often incorrectly called an oval. In common usage the word ellipse is applied both to the figure and to the curve.

4. An **Oval** is a plane figure bounded by a curve having the shape of an egg viewed sidewise.

NOTE.—An oval has one axis of symmetry, its long diameter. An ellipse has two axes of symmetry, its long and short diameters. The circle has an infinite number, since each diameter divides it into two semicircles.

5. A **Reversed Curve** is a curve that reverses its direction; it really consists of two curves.

6. **Abstract Curves** are curves so combined that they represent nothing created, natural or artificial.

7. A **Plane Spiral** is a curved line produced by the revolution of one point about another, the distance between the two points constantly increasing according to some law.

NOTE.—Curves which have clearly defined and constant features, like the circle, ellipse, and spiral, are called mathematical curves; all others, like the oval and reversed curves, which have not such features, are sometimes called hand-curves.

A SYSTEM OF INDUSTRIAL AND ARTISTIC DRAWING FOR PUBLIC SCHOOLS.

PREPARED BY PROF. WALTER SMITH,

State Director of Art Education for Massachusetts, General Supervisor of Drawing in the Boston Public Schools, and Director of the Massachusetts Normal Art School.

THIS is the only comprehensive system of instruction in drawing available for American schools. The instruction is so graded as to meet the wants of every grade of pupils, from the lowest primary class to the most advanced class of the high school. The system comprises

A Primary Course, An Intermediate Course,
A Grammar Course, A High School Course.

THE PRIMARY COURSE.

This course consists of a Manual for the use of teachers, in which the simple elements of the study are explained and illustrated by the most familiar terms and examples; and two series of Cards, containing exercises for pupils to draw on their slates. It explains and illustrates the simpler principles of both geometrical and conventional design.

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FIRST. Four Books in Freehand Outline Drawing from Flat Copies, and Design. The exercises are more advanced than those in the Intermediate Course; and by a wide variety of conventional, and natural forms, and representations of historical ornament, pupils are taught a great deal about the decorative art of past ages, and also about the general principles of good Design and the special features of the Classic Styles.

SECOND. Four Books in Geometrical Drawing, with Instruments. These books form the basis for Perspective, Model and Object, and Mechanical

Drawing. The exercises consist of problems in Plane Geometry, the working of which teaches pupils the exact meaning of words and terms. By the care required to execute the problems they are trained to accuracy of workmanship.

THIRD. Two Books in Model and Object Drawing, Freehand. The exercises in these books are all in outline; and pupils are taught in a thorough manner how to draw from objects. The exercises in these as in all the other books are of such a character, that the pupil's taste will be cultivated while he is acquiring skill in drawing.

FOURTH. Two Books in Perspective Drawing, with Instruments. These books teach thoroughly the elements of Parallel and Angular Perspective.

This course is accompanied by a Manual for Teachers, containing all the exercises in the books, and many more besides, with a full explanation of methods and principles.

Price of the Manual, \$3.00; of the Drawing-Books, 25 cents each.

Where pupils in grammar schools have received no previous instruction in Freehand Drawing, the first grading of the instruction in the grammar schools must be provisional.

THE HIGH SCHOOL COURSE.

This course consists of advanced work in Perspective, Model, and Object Drawing, and Mechanical Drawing, intended to be in large part elective.

In the previous courses, only outline work is attempted, in order that pupils may become well grounded in all the elementary principles of Industrial or Artistic Drawing. When they reach the high school, they are able to take up understandingly the more advanced phases of the study. In the high school, pupils may be allowed some election in their course of study, according to their tastes or inclinations: some may prefer a purely artistic course, and others a mechanical course. Their previous training fits them for either.

The High School Course includes instruction in Shading, Painting, Drawing from Nature, and Designing in Color, and Applied Design.

Books for this course are in preparation.

AMERICAN TEXT BOOKS OF ART EDUCATION

BY
WALTER SMITH
STATE DIRECTOR
OF
ART EDUCATION
FOR
MASSACHUSETTS

NUMBER

TWO

INTERMEDIATE COURSE

L. PRANG & COMPANY
BOSTON

FREEHAND DRAWING FROM FLAT COPIES.

GENERAL DIRECTIONS FOR TEACHER AND PUPIL.

FOR THE TEACHER.

I. YOU will usually find it best to take personal charge, between lessons, of the drawing-books, pencils, and rubbers. Do not consume, at a lesson, more than one minute in their distribution or collection.

II. Before the class begin to draw any copy which their books contain, require them to look at it carefully while you give the directions, as set forth in the Manual, for drawing it. Have them repeat the directions until you are certain they understand the different steps to be taken. Occasionally require the class, before drawing a form, to analyze it, as described in the Manual.

III. See that the whole class work together, as a rule, doing the same thing at the same time. By the aid of the blackboard you can keep all together. But do not spend at the blackboard, on an average, more than one tenth of the time devoted to the lesson. Give the other nine tenths to individual instruction.

IV. See that the learner always draws, *First*, with understanding; *Second*, with rapidity; *Third*, with as much precision as rapid drawing will admit. Do not make fine finish the leading feature; at least, do not sacrifice to this either knowledge or celerity of execution.

V. Blackboard, dictation, and memory lessons, with original design, are leading features in this course of drawing. It is for these that the blank pages are inserted. For specific directions see the Manual.

FOR THE PUPIL.

To insure accuracy and to avoid loss of time, proceed thus with each exercise: *First*, draw the construction or guide lines, which are usually dotted in the printed copy; *Second*, sketch the looser lines of the form, or object, and then the shorter ones; *Third*, line in, that is, finish, the complete form.

The First Stage.

DRAWING THE GUIDE LINES. — To secure a correct final result you must both accurately place and accurately divide these lines. Do not dot them as in the printed copies, but make them continuous and faint. Do not attempt to draw the form without these lines.

The Second Stage.

SKETCHING THE FORM. — After the guide lines have been drawn, sketch the form; that is, draw it in light line, the lighter the better, in order that errors may be easily corrected. Turn the book for the detection of errors.

The Third Stage.

LINING IN. — Erase the guide lines, and all other lines and parts of lines which are not to appear in the finished drawing; partly erase the sketch of the form, as it is to appear when lined in, making the lines just visible; clean the paper. The work is now ready for finishing or lining in. The pencil should have a sharp point; and it should be held more nearly upright than in sketching, that the side of the pencil may not touch the paper. Make a firm, bold line, and of the same thickness throughout, unless there is a difference in the copy.

General Remarks.

POSITION OF BOOK. — Place the book so that you can most easily draw the exercise or any part of it. The following will be found the best general rules: for Stage 1 keep the book square with the edges of the desk, that the horizontal and vertical lines may be for more accurately drawn. For Stages 2 and 3 keep the book as far as possible in the same position as in Stage 1. By turning the hand and pencil you will frequently avoid the necessity of turning the book.

DRAWING CURVES. — For a long, flat curve, make the wrist the centre from which the curve is struck; draw short, round curves with the fingers alone. See that the curve, when you are drawing it, is concave towards the fingers; if it is convex towards the fingers, then turn the book.

PENCIL, RUBBER, ETC. — Keep your pencil point in good condition by rubbing it sidewise on a piece of paper. Do not wet the paper, lest it make lines too black and difficult to erase. Do not hold the rubber in the hand while you are using the pencil, lest it become moist. Use the rubber sparingly in Stages 1 and 2. Before beginning Stage 3 you may use it freely, for your drawing should not be spoiled by imperfectly erased faults. Do not measure the drawing without permission of the teacher. Work rapidly, yet always avoid the haste that is heedless. Be patient, industrious, careful, persevering, and you will certainly succeed.

PRINCIPLES OF DESIGN ILLUSTRATED IN THIS BOOK.

I. BEAUTY RESULTING FROM SUBLTLETY.

1. A subtle proportion is more pleasing than a simple proportion. Thus the proportion 2 to 3 is more pleasing than the proportion 1 to 2; and 3 to 5 is more pleasing than 2 to 3. It is more difficult for the eye to detect a subtle proportion than a simple one. Both the ornament and the form of the object should have a distinct proportion.

2. A subtle curve is more pleasing than a simple curve. Thus an elliptical curve is more beautiful than a circular curve. The character of the latter is more readily detected by the eye. If the two segments of a reversed curve are parts of a circle, the curve is less beautiful than one whose change of direction is gradual and not all at one point.

3. A tangential union of curves, or of curves and straight lines, is more pleasing than a secant, abrupt union. In the former case one line blends insensibly into the other; but in the latter case the junction is strongly marked. For agreeable effect there must be no abrupt change in the direction of a line.

II. BEAUTY RESULTING FROM ORDERLY ARRANGEMENT.

1. Orderly arrangement is secured by symmetrical repetition about a centre, as of a circle, a triangle, a square, a pentagon. This form of repetition requires that all parts of the figure having the same relation to the centre should be treated exactly alike. Thus there can be no line without its companions; no superfluous line, as there would be in a disorderly arrangement.

2. Orderly arrangement is secured by symmetrical repetition on an axis. This form of repetition requires that there be a perfect balance of parts, that the right-hand side of the figure correspond exactly to the left-hand. A violation of this law of ornament produces always a disagreeable effect.

3. Orderly arrangement is secured by a regular repetition of the symmetrical unit, or repeat. This repetition may be made horizontally or vertically, as in the case of mouldings on a wall; or it may be made in all directions, as in a design for a carpet or for the decoration of a ceiling. This orderly repetition of an ornament usually gives an increase of beauty, while a disorderly arrangement would be exceedingly disagreeable.

III. ADAPTATION OF THE DESIGN TO POSITION.

1. When a design is to be viewed from all sides, as an ornament on a ceiling or a carpet pattern, it should be so constructed that it will always be seen right way up. With symmetrical arrangement about a centre this always happens.

2. When a design is to be viewed from only one side, as in the case of an ornament on the wall of a room, it will be seen right way up, whether the arrangement be around a centre or on an axis, provided the axis is vertical. This position of the axis must be maintained, whether the unit is repeated up and down or right and left.

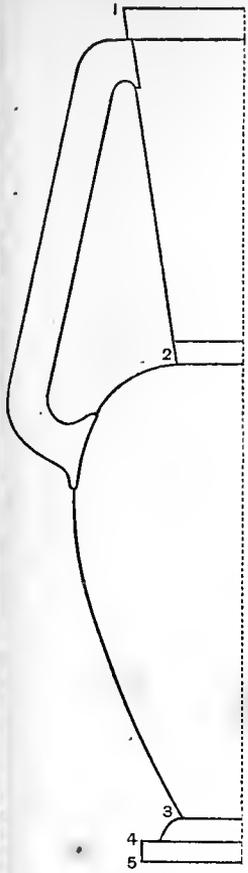
IV. ADAPTATION OF THE DESIGN TO MATERIAL AND USE.

1. Due regard must always be paid to the material of which the object is to be made, or to which the ornament is to be applied. A design for an object to be made of metal will not necessarily answer for a similar object to be made of clay. If an ornament is to be cut in granite, for example, the lines must be few; if engraved on silver, the ornament may be elaborate.

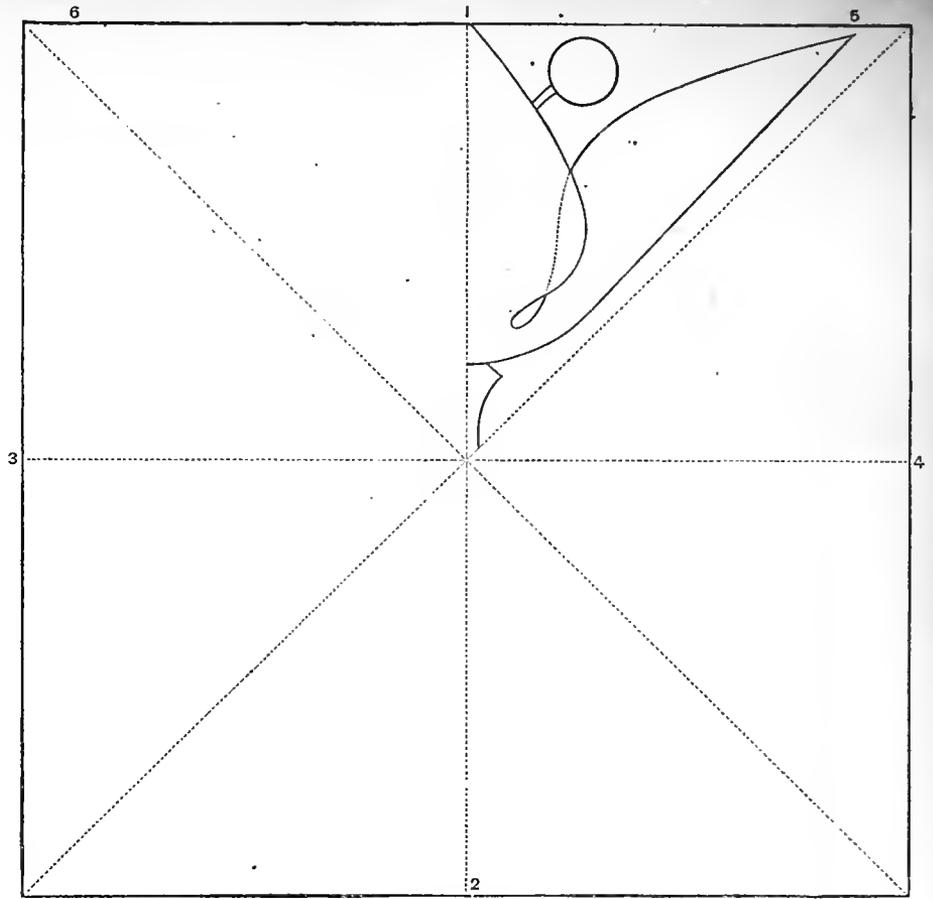
2. The use to which an object is to be put must be first considered in determining its form. To this form the decoration, if there is any, must be adapted. It should also be in harmony with the use. The form of an object is not to be adapted to its decoration.

Nearly all the designs in this book are geometrical, being combinations of straight and curved lines without an attempt to represent objects, natural or artificial. A few arc outline designs for vases, pitchers, and the like. There are no conventional forms. The Manual gives full explanation of the principles, and it is expected that the teacher will explain them to his pupils as they advance with the drawings. When they have concluded the book, they should be able to give an account of these principles and to illustrate them with original designs.

The Pitcher is an example of symmetry, — draw the balancing half and complete it. The square rosette illustrates repetition round a centre. Draw the ornament seven times and finish the pattern.

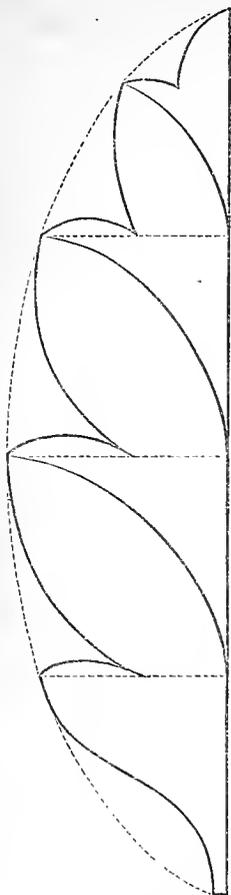


1. — Glass Pitcher. To be completed.

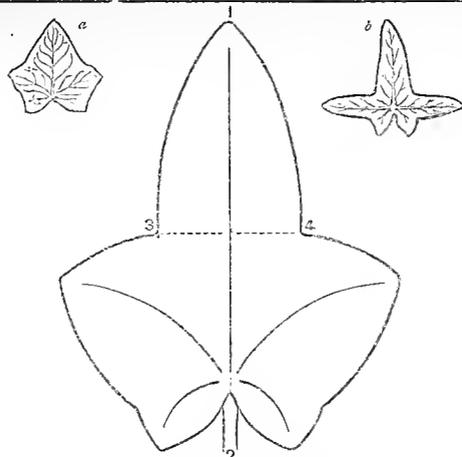


2. — Square Rosette.

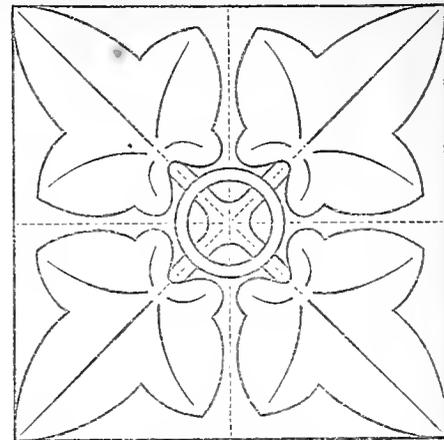
These forms are on a bold scale, and the curves are gradual. Make the complete figures as though all were printed.



3. — Conventional Leaf, to be Completed.



4. — Conventional Ivy Leaf.



5. — Ivy-Leaf Rosette.

For Ivy Leaf.

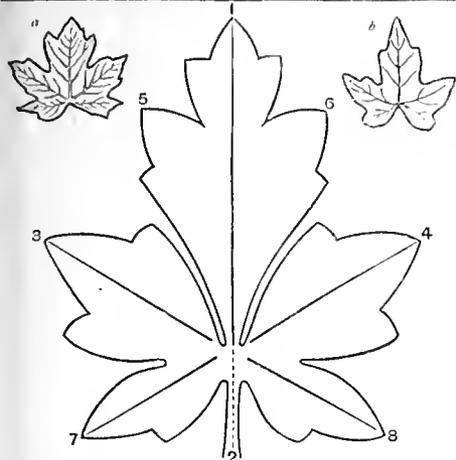
For Ivy-Leaf Rosette.

Having made allowance for margin, divide the page into three equal parts by two horizontal lines. In each of these is to be placed a horizontal moulding

Divide the page into two equal parts by a vertical line. Divide the right half into two equal parts by a vertical line.

The first step in original decorative design is to make a new arrangement of an old form; the second step is to conventionalize a natural form, and with this new conventional form to make a design.

Original Design from the Maple Leaf to fill an equilateral triangle, square, pentagon, or hexagon.

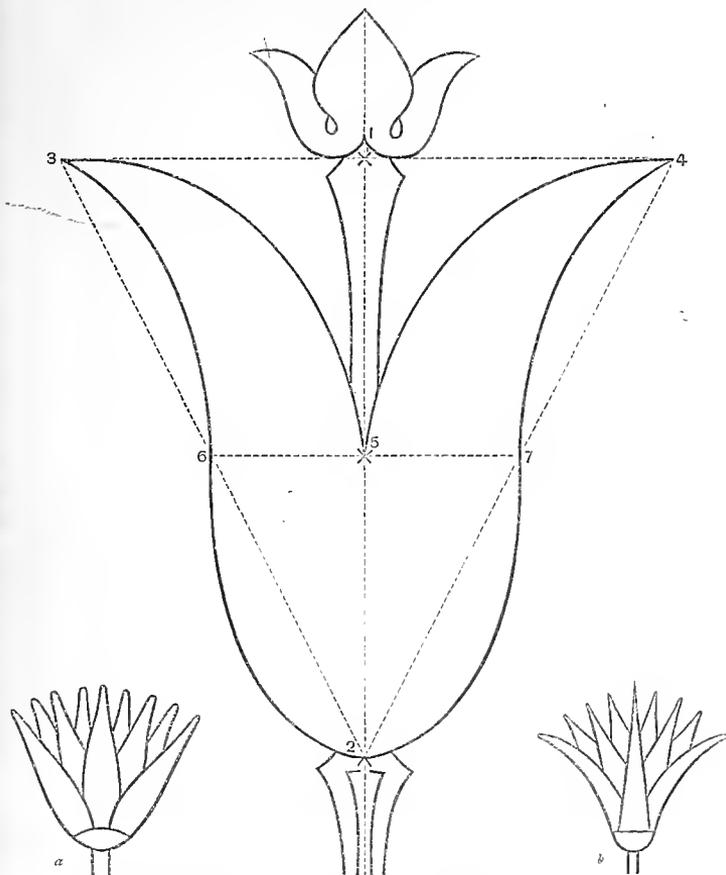


6. — Conventional Maple Leaf.

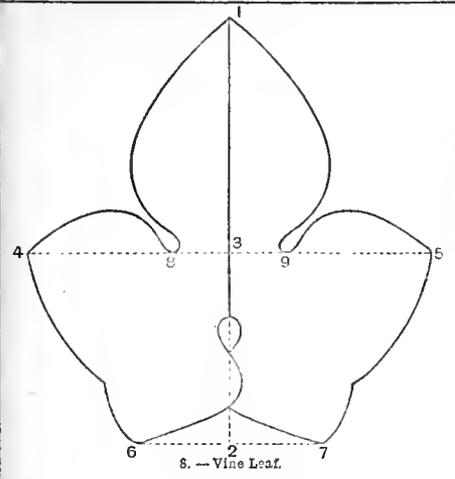
For the Conventional Maple Leaf.

The merits of the original design to be drawn above will depend upon two things: 1. the knowledge and taste displayed in the arrangement; 2. the beauty of the execution. The first is always the more important.

The lotus, or lily, was much used by the Egyptians for purposes of decoration. It was the first flower to appear after the annual overflow of the Nile had subsided, and was regarded as the symbol of life after death.

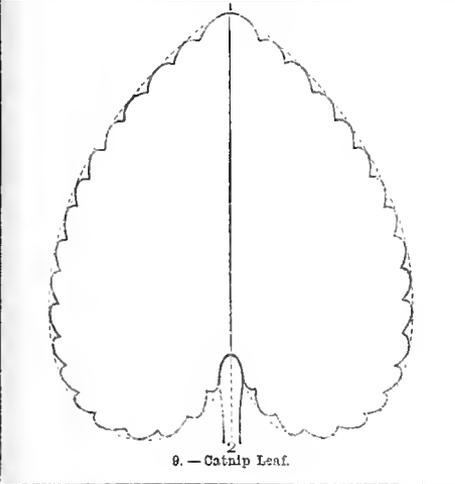


7. - Lotus Form.



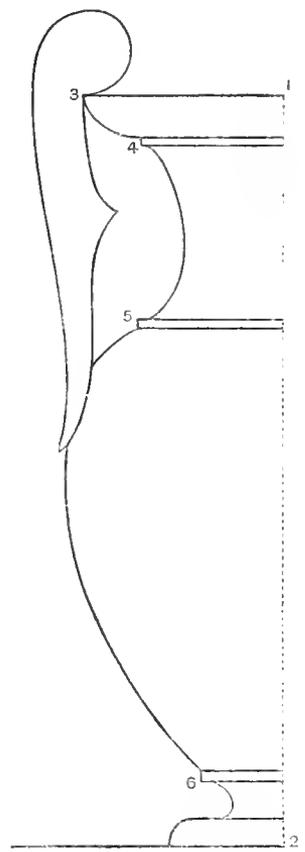
8. — Vine Leaf.

For Vine Leaf.



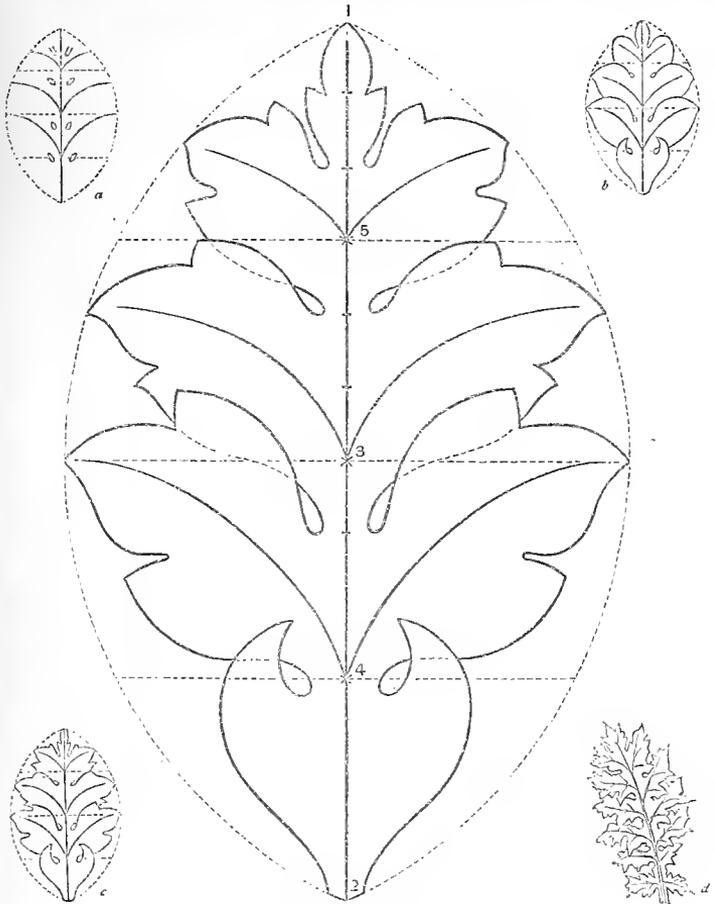
9. — Catnip Leaf.

For Catnip Leaf.



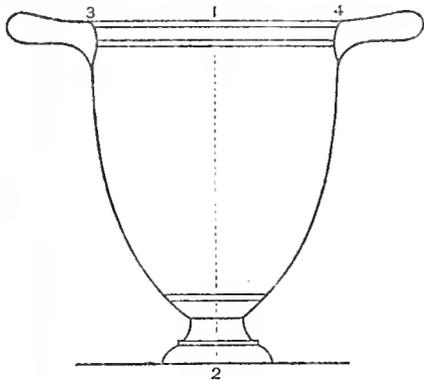
10. — Vase in Greek style. To be completed.

In the vase exercise the lesson is to make a symmetrical form. See that the right side exactly balances the left.



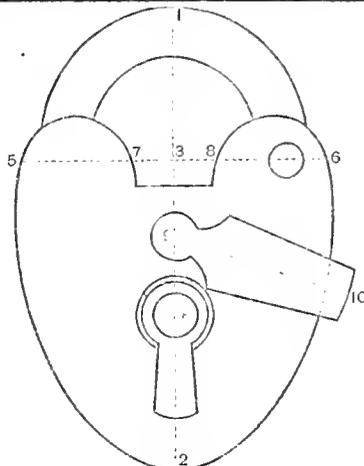
11. — Conventional Acanthus Leaf.

The three sketches *a*, *b*, *c* show how to advance three stages in drawing this leaf. Begin as at *a* and finish like *c*. *d* is the natural leaf.



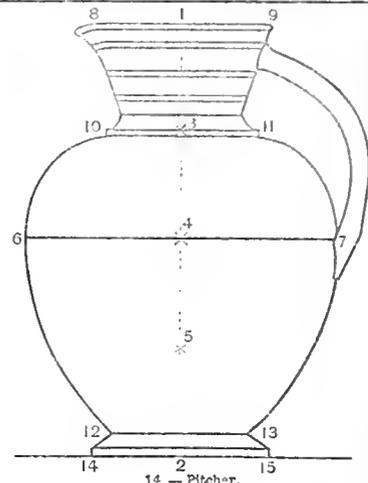
12. — Greek Vase.

For Greek Vase.



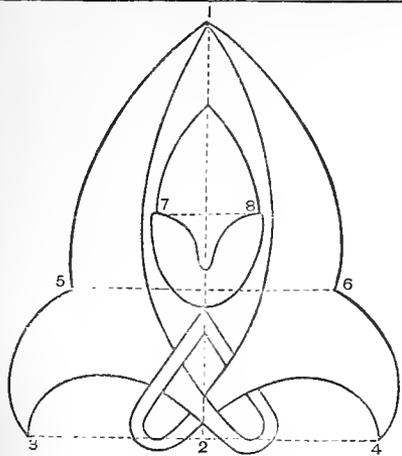
13. — Padlock.

For Padlock.



14. — Pitcher.

For Pitcher.

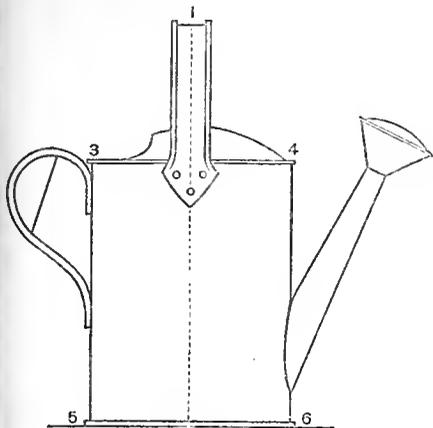


15. — Moresque Ornament.

Copy the above.

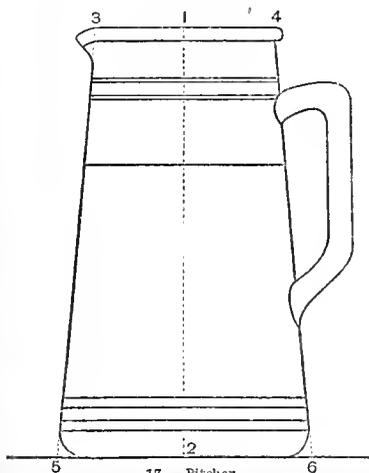
Ex. 15 enlarged to fill the space.

Before beginning to draw the square rosette from memory look well at it in Exercise 5; but never once look back at the copy while drawing it.

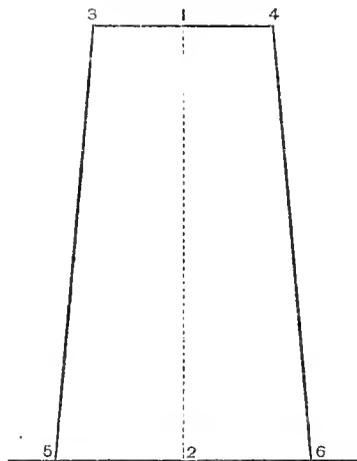


16. $\frac{2}{2}$ Water-pot.

Copy the water-pot above this.

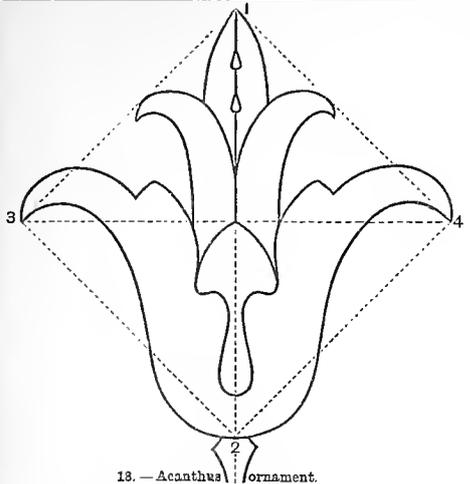


17. — Pitcher.

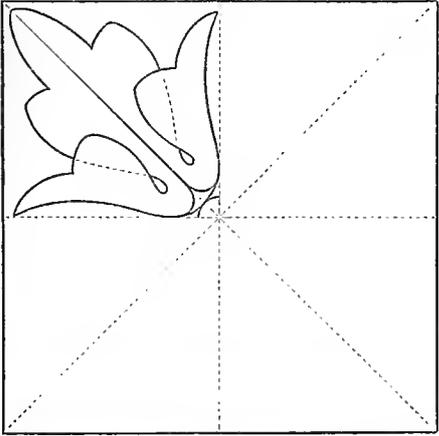


How to begin the pitcher. — Complete it.

Here draw the pitcher twice as large as the copy.



18. — Acanthus ornament.



19. — Square rosette. To be completed.

For Acanthus ornament, to be enlarged to twice the height.

To enlarge Ex. 18, draw the line 1 a vertically twice the length of the copy. Then make the square 2 3 4 upon it.

Divide the page into two equal parts by a vertical line.

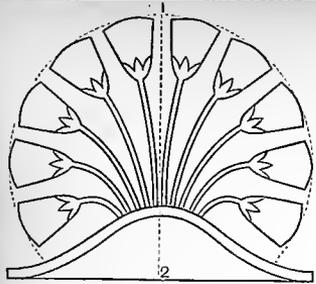
Divide the page into two equal parts by a vertical line.



20. — Leaf, flower, and fruit of the potato plant.

Draw the stems of the leaves and flowers first, and in their right places. Complete the leaves and flowers and then add the fruit.

This space to be filled with one of the given Anthemion Forms.



21. — Anthemion Form : Egyptian.



22. — Anthemion Form : Greek.



23. — Anthemion Form : Roman.

The Egyptian example is taken from the papyrus; the Greek from the honeysuckle; the Roman from the acanthus. In the Egyptian the form inclines to straight and simple lines, in the Greek to spiral and subtle forms, and in the Roman to elaborate enrichment.

DEFINITIONS.

Before the pupil lays aside this book he should have a clear understanding of the definitions which follow. They should be learned and frequently reviewed in connection with the drawing-lessons. The Manual contains much more relating to the same.

I. A **POINT** is position only; therefore it has no length, breadth, or thickness.

NOTE.—In drawing, a point is represented by a dot, which has size

II. A **LINE** has length, but no breadth or thickness.

NOTE.—In drawing, a line is represented by a pencil-mark, which has breadth.

1. **Lines named from their appearance** are straight, curved, or broken; or continuous or discontinuous.

a. A *Straight Line* has the same direction throughout its whole length.

b. A *Curved Line* constantly changes its direction; it has no three consecutive points in a straight line.

c. A *Broken Line* consists of a series of straight lines united one to the end of another, but having different directions.

d. A *Continuous Line* is an uninterrupted line; it may be either straight or curved.

e. A *Discontinuous Line* is a line which is interrupted at intervals; it may be either straight or curved.

2. **Straight Lines named from their position** are horizontal, vertical, or oblique.

NOTE.—The absolute position of a line is determined by its relation to the centre of the earth. In drawing, however, the surface on which the line is drawn is also taken into consideration. The surface is usually regarded as an upright plane; and the definitions here given conform to this view.

a. A *Horizontal Line* is a straight line which inclines neither up nor down.

b. A *Vertical Line* is a straight line which extends up and down and does not incline in any direction.

c. An *Oblique Line* is a straight line which inclines more or less.

NOTE.—The drawing-book must be regarded as in a vertical position, like the blackboard on the wall of the room. Hence a horizontal line in the book has the same direction as the upper edge of the book; a vertical line, the same direction as the right-hand edge; and a straight line drawn in any other direction is oblique.

3. **Lines named from their relation to one another** are perpendicular, oblique, or parallel.

a. A *Perpendicular Line*. One straight line is said to be perpendicular to another straight line, when the two form a right angle.

NOTE.—When we simply say of a line that it is perpendicular, we mean that it is vertical; but when we say that it is perpendicular to another line, it may be vertical, horizontal, or oblique, if its position is considered.

b. An *Oblique Line*. One straight line is said to be oblique to another straight line, when the two do not form a right angle.

c. *Parallel Lines*. Two lines, straight or curved, are said to be parallel when they lie side by side and have the same direction throughout their whole length.

NOTE.—Geometry knows nothing of lines except in their relation to one another, since it knows nothing of up and down, of right and left.

III. **SURFACE**. Space enclosed by lines is called surface; it has, therefore, length and breadth, but no thickness.

1. A **Plane**. Surface to all parts of which a rule can be exactly applied, is called a plane.

2. **Curved Surface**. When a surface curves like the outside of a cup, it is called convex; when it curves like the inside of a cup, it is called concave.

IV. A **SOLID**. Space enclosed by surfaces is called a solid; a solid has length, breadth, and thickness.

NOTE.—Thus we have, 1. a point,—no dimension; 2. a line,—one dimension; 3. a surface,—two dimensions; 4. a solid,—three dimensions. Solid here means quantity, or volume.

V. An **ANGLE** is the difference in direction of two straight lines which meet or only tend towards each other.

NOTE.—The word angle is often applied to the point where the lines meet,—the vertex of the angle.

1. **Different Angles**. When two straight lines cross each other so as to form four equal angles, as a vertical and a horizontal line would, each is called a right angle. An acute angle is smaller than a right angle; an obtuse angle is larger than a right angle.

NOTE.—The size of an angle depends, not on the length of the lines, but on the difference in their direction.

VI. A **TRIANGLE**. Any plane surface or figure bounded by three straight lines, or sides, is called a triangle.

1. **Different Triangles**. A *Right Triangle* contains a right angle. An *Equilateral Triangle* has three equal sides. An *Isosceles Triangle* has two of its sides equal. A *Scalene Triangle* has no two of its sides equal, and contains no right angle.

2. **Similar and Equal Triangles**. Two triangles, or any two plane figures, are said to be similar, when they have the same shape; equal, when they have the same area or surface.

3. An **Axis of Symmetry** is a line that divides a figure into two similar and equal parts, which balance each other without change of position. An isosceles triangle has one axis of symmetry; an equilateral, three.

VII. A **QUADRILATERAL**. Any plane surface or figure bounded by four straight sides is called a quadrilateral.

1. A **Square** has four equal straight sides and four equal angles.

a. A *Diameter of a Square* is a straight line drawn through the centre of the square, parallel to two of its sides.

NOTE.—This line is much used in drawing, and is so called for want of a better term.

b. A *Diagonal of a Square* is a straight line connecting opposite angles, or corners of the square.

2. **Other Quadrilaterals**. A *Rhombus* has four equal sides, but unequal angles. An *Oblong* has four equal angles, but only its opposite sides are equal. A *Rhomboid* has only opposite sides and opposite angles equal.

NOTE.—When a quadrilateral has four right angles, it is sometimes called a *Rectangle*; when it has its opposite sides parallel it is sometimes called a *Parallelogram*.

VIII. A **POLYGON**. Any plane figure bounded by more than four straight sides, and having more than four angles, is called a polygon, which means having many angles.

NOTE.—If the sides and angles are equal, the figure is called a regular polygon; if they are unequal, then it is called an irregular polygon. Polygons have different names, as pentagon, hexagon, etc.

1. A **Regular Pentagon** has five equal straight sides and five equal angles.

2. A **Regular Hexagon** has six equal straight sides and six equal angles.

3. A **Regular Octagon** has eight equal straight sides and eight equal angles.

NOTE.—The regular pentagon has five axes of symmetry; the regular hexagon, six; the regular octagon, eight.

IX. **CURVED LINES and CURVED FIGURES**. A line which constantly changes its direction, and has no three consecutive points in the same straight line, is called a curve; and any figure bounded by such a line is called a curved figure.

1. **Circular Curve and Circumference**. A circular curve is drawn in one plane and bends equally in all its parts; if continued far enough, the two ends unite, and it becomes a circumference.

2. A **Circle** is a plane figure bounded by a curve, called the circumference, all parts of which are at the same distance from a point within, called the centre.

NOTE.—The word circle is frequently used to denote the circumference as well as the space enclosed by it.

a. The *Radius of a Circle* is a straight line drawn from the centre to the circumference.

b. The *Diameter of a Circle* is a straight line drawn through the centre and touching the circumference on both sides.

3. **OTHER PARTS OF A CIRCLE**. A *Sector* is the space included between any part of the circumference and two radii of a circle. A *Quadrant* is the space included between a quarter of the circumference and two radii of a circle. An *Arc* is any part of the circumference of a circle. A *Chord* is a straight line connecting the two ends of an arc. A *Segment* is the space included between an arc and its chord.

d. The *Altitude of a Curve* is the perpendicular distance from its base, or chord, to the highest point in the curve.

3. An **Ellipse** is a plane figure bounded by a curve, every point of which is at the same combined distance from two points called the foci.

NOTE.—The ellipse is often incorrectly called an oval. In common usage the word ellipse is applied both to the figure and to the curve.

4. An **Oval** is a plane figure bounded by a curve having the shape of an egg viewed sidewise.

NOTE.—An oval has one axis of symmetry, its long diameter. An ellipse has two axes of symmetry, its long and short diameters. The circle has an infinite number, since each diameter divides it into two semicircles.

5. A **Reversed Curve** is a curve that reverses its direction; it really consists of two curves.

6. **Abstract Curves** are curves so combined that they represent nothing created, natural or artificial.

7. A **Plane Spiral** is a curved line produced by the revolution of one point about another, the distance between the two points constantly increasing according to some law.

NOTE.—Curves which have clearly defined and constant features, like the circle, ellipse, and spiral, are called mathematical curves; all others, like the oval and reversed curves, which have no such features, are sometimes called hand-curves.

A SYSTEM OF INDUSTRIAL AND ARTISTIC DRAWING FOR PUBLIC SCHOOLS.

PREPARED BY PROF. WALTER SMITH,

State Director of Art Education for Massachusetts, General Supervisor of Drawing in the Boston Public Schools, and Director of the Massachusetts Normal Art School.

THIS is the only comprehensive system of instruction in drawing available for American schools. The instruction is so graded as to meet the wants of every grade of pupils, from the lowest primary class to the most advanced class of the high school. The system comprises

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This course consists of:—

FIRST. Four Books in Freehand Outline Drawing from Flat Copies, and Design. The exercises are more advanced than those in the Intermediate Course; and by a wide variety of conventional, and natural forms, and representations of historical ornament, pupils are taught a great deal about the decorative art of past ages, and also about the general principles of good Design and the special features of the Classic Styles.

SECOND. Four Books in Geometrical Drawing, with Instruments. These books form the basis for Perspective, Model and Object, and Mechanical

Drawing. The exercises consist of problems in Plane Geometry, the working of which teaches pupils the exact meaning of words and terms. By the care required to execute the problems they are trained to accuracy of workmanship.

THIRD. Two Books in Model and Object Drawing, Freehand. The exercises in these books are all in outline; and pupils are taught in a thorough manner how to draw from objects. The exercises in these as in all the other books are of such a character, that the pupil's taste will be cultivated while he is acquiring skill in drawing.

FOURTH. Two Books in Perspective Drawing, with Instruments. These books teach thoroughly the elements of Parallel and Angular Perspective.

This course is accompanied by a Manual for Teachers, containing all the exercises in the books, and many more besides, with a full explanation of methods and principles.

Price of the Manual, \$3.00; of the Drawing-Books, 25 cents each.

Where pupils in grammar schools have received no previous instruction in Freehand Drawing, the first grading of the instruction in the grammar schools must be provisional.

THE HIGH SCHOOL COURSE.

This course consists of advanced work in Perspective, Model, and Object Drawing, and Mechanical Drawing, intended to be in large part elective.

In the previous courses, only outline work is attempted, in order that pupils may become well grounded in all the elementary principles of Industrial or Artistic Drawing. When they reach the high school, they are able to take up understandingly the more advanced phases of the study. In the high school, pupils may be allowed some election in their course of study, according to their tastes or inclinations: some may prefer a purely artistic course, and others a mechanical course. Their previous training fits them for either.

The High School Course includes instruction in Shading, Painting, Drawing from Nature, and Designing in Color, and Applied Design.

Books for this course are in preparation.

AMERICAN TEXT BOOKS OF ART EDUCATION

BY
WALTER SMITH
STATE DIRECTOR
OF
ART EDUCATION
FOR
MASSACHUSETTS

NUMBER

THREE

INTERMEDIATE COURSE

L. PRANG & COMPANY
BOSTON

MODEL AND OBJECT DRAWING: FREEHAND.

GENERAL DIRECTIONS FOR TEACHER AND PUPIL.

FOR THE TEACHER.

I. YOU will usually find it best to take personal charge, between lessons, of the drawing-books, pencils, and rubbers. Do not consume, at a lesson, more than one minute in their distribution or collection.

II. See that each pupil, before he begins to draw, has a clear knowledge of the principles to be illustrated by the lesson.

III. Before the class begin to draw any copy which their books contain, require them to look at it carefully while you give the directions, as set forth in the Manual, for drawing it. Have them repeat the directions until you are certain they understand the different steps to be taken. Occasionally require the class, before drawing a form, to analyze it, as described in the Manual.

IV. See that the whole class work together, as a rule, doing the same thing at the same time. By the aid of the blackboard you can keep all together. But do not spend at the blackboard, on an average, more than one tenth of the time devoted to the lesson. Give the other nine tenths to individual instruction.

V. See that the learner always draws, *First*, with understanding; *Second*, with rapidity; *Third*, with as much precision as rapid drawing will admit. Do not make fine finish the leading feature; at least, do not sacrifice to this either knowledge or celerity of execution.

VI. Have the blank pages filled with drawings made from the actual solid or object. For specific directions see the Manual.

FOR THE PUPIL.

To insure accuracy and to avoid loss of time, proceed thus with each exercise: *First*, draw the construction or guide lines, which are usually dotted in the printed copy; *Second*, sketch the longer lines of the form, or object, and then the shorter ones; *Third*, line in, that is, finish, the complete form.

The First Stage.

DRAWING THE GUIDE LINES.—To secure a correct final result you must both accurately place and accurately divide these lines. Do not dot them as in the printed copies, but make them continuous and faint. Do not attempt to draw the form without these lines.

The Second Stage.

SKETCHING THE FORM.—After the guide lines have been drawn, sketch the form; that is, draw it in light line, the lighter the better, in order that errors may be easily corrected. Turn the book for the detection of errors.

The Third Stage.

LINING IN.—Erase the guide lines, and all other lines and parts of lines which are not to appear in the finished drawing; partly erase the sketch of the form, as it is to appear when lined in, making the lines just visible; clean the paper. The work is now ready for finishing or lining in. The pencil should have a sharp point; and it should be held more nearly upright than in sketching, that the side of the pencil may not touch the paper. Make a firm, bold line, and of the same thickness throughout, unless there is a difference in the copy.

General Remarks.

POSITION OF BOOK.—Place the book so that you can most easily draw the exercise or any part of it. The following will be found the best general rules: for Stage 1 keep the book square with the edges of the desk, that the horizontal and vertical lines may be the more accurately drawn. For Stages 2 and 3 keep the book as far as possible in the same position as in Stage 1. By turning the hand and pencil you will frequently avoid the necessity of turning the book.

DRAWING CURVES.—For a long, flat curve, make the wrist the centre from which the curve is struck; draw short, round curves with the fingers alone. See that the curve, when you are drawing it, is concave towards the fingers; if it is convex towards the fingers, then turn the book.

PENCIL, RUBBER, ETC.—Keep your pencil point in good condition by rubbing it sidewise on a piece of paper. Do not wet the point, lest it make lines too black and difficult to erase. Do not hold the rubber in the hand while you are using the pencil, lest it become moist. Use the rubber sparingly in Stages 1 and 2. Before beginning Stage 3 you may use it freely, for your drawing should not be spoiled by imperfectly erased faults. Do not measure the drawing without permission of the teacher.

GEOMETRICAL SOLIDS DEFINED AND DESCRIBED.

THE definitions which follow grow out of the definitions previously given for plane geometrical figures.

I. **Surface.**—Surface has two dimensions, length and breadth. It is usually bounded by lines, but it sometimes ends.



Sphere.

II. **A Solid.**—A solid has three dimensions,—length, breadth, and thickness. It is bounded by one or more surfaces.

NOTE.—Of course, the term "solid," as used in these definitions, has no reference to hardness, but simply to space,—to volume.

III. **A Sphere.**—The solid described by the revolution of a circle about its diameter is called a sphere.

NOTE.—A sphere is bounded by one endless curved surface; that is, by a surface un-
limited by lines. Every point of this surface is at the same distance from a point within called the centre of the sphere.

IV. **A Cone.**—The solid described by revolving a right triangle about its perpendicular is called a cone.



Cone.

NOTE.—The top of the cone is called the apex; the bottom, the base. A straight line from the centre of the base to the apex is called the axis of the cone.

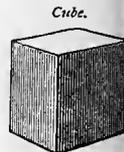
V. **A Cylinder.**—The solid described by the revolution of a rectangular plane about one of its sides is called a cylinder.

NOTE.—If a door could swing entirely around on its hinges, it would describe a cylinder. A straight line joining the centres of the ends is called the axis of the cylinder.



Cylinder.

VI. **A Cube.**—A solid bounded by six square planes is called a cube.

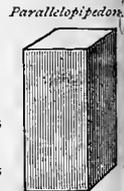


Cube.

VII. **A Parallelepipedon.**—A solid bounded by four equal rectangular oblong planes and by two equal square planes is called a parallelepipedon.

NOTE.—It will be seen that much of what may be said of the cube can be said of this solid.

VII. **A Square Plinth.**—A section of a rectangular prism or parallelepipedon is called a square plinth.



Parallelepipedon.



Square Plinth.

All the geometrical solids the pupil will have occasion to draw in this book have now been defined.

EXERCISE I.— Circle, Ellipse, Cone, and Cylinder.

A circle may appear of three forms. — First, as a true circle, as in sketch 1. Second, as a straight line, as in 2. Third, as an ellipse, as in 3 and 4. A circle viewed obliquely appears as an ellipse. Sketch 1 is a full front view; sketch 2, an edge view; sketches 3 and 4 are views of the same circle when turned partly away from the eye. Lines A B and C D are the diameters of the circle and of the ellipse. Draw them first and add the curves.

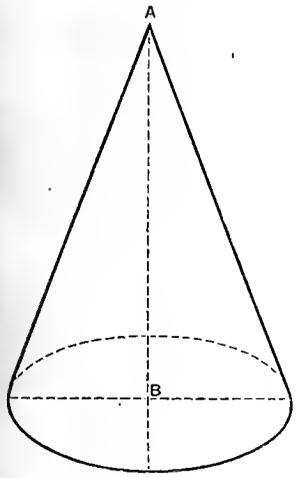
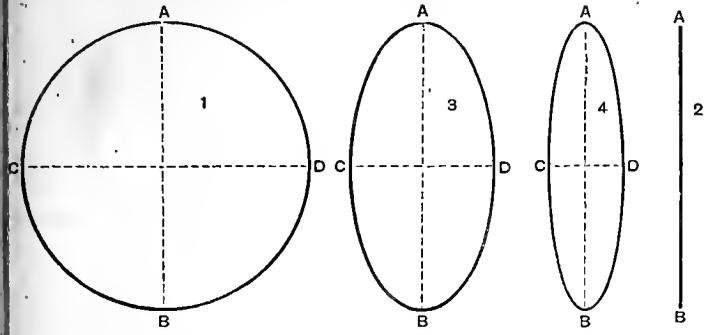


Fig. 1. — Cone.

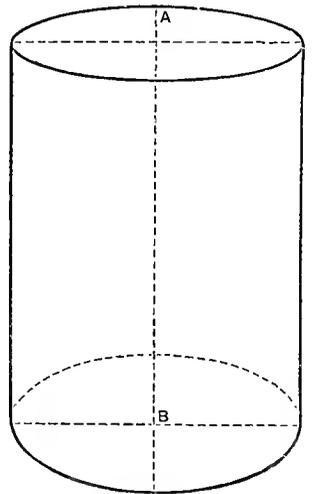


Fig. 2. — Cylinder.

Fig. 1. CONE. — The cone has a circle for its base; seen from above the circle appears as an ellipse, like sketch 3, placed horizontally. The dotted line indicates the invisible part of it. The line from the centre of base to top of the cone is called the *axis*, and the top point of the axis is the *apex* of the cone.
 Fig. 2. CYLINDER. — The cylinder has a circle at both ends, the upper one like sketch 4, the lower like sketch 3 placed horizontally. A B is its *axis* from centre to centre of both ends. Draw the axes of both solids first.

EXERCISE 11.—Cone and Cylinder lying on their sides.

2

Fig. 3. CONE LYING ON ITS SIDE.—When the base of the cone is visible, and partly turned away, it appears an ellipse. Draw A B, the axis, first. Draw C D perpendicular to A B. Make B E and B F equal, and draw an ellipse through E F C D. From A draw tangents to the elliptic curve.

Fig. 3 — Cone.

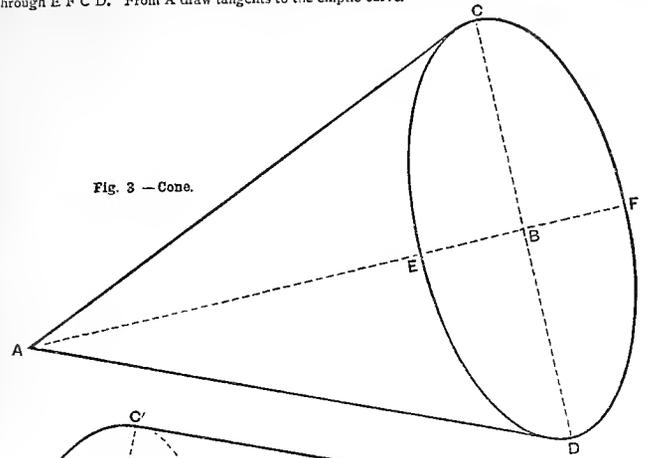


Fig. 4 — Cylinder.

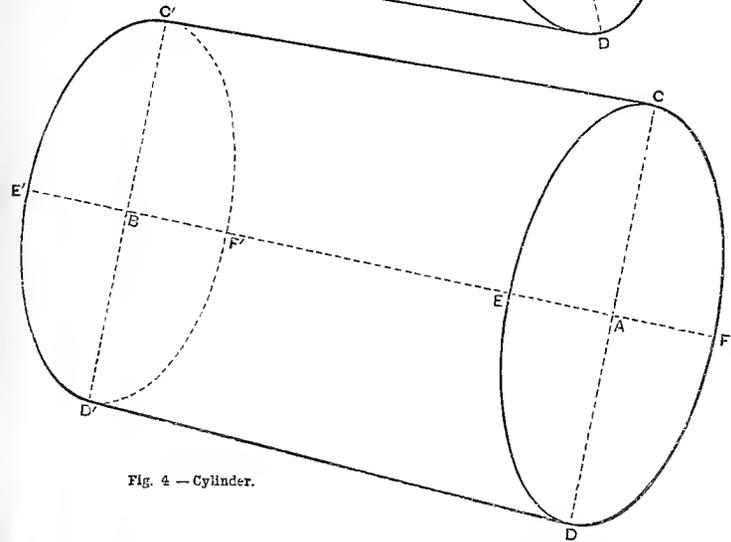


Fig. 4. CYLINDER LYING ON ITS SIDE.—Draw A B, the axis, first. Draw C D perpendicular to A B. Make A E, A F equal to each other, and then draw the ellipse through C D, E F. Make C' D' less than C D, and B' E', B' F' about the same as A E, A F, and draw the distant end of the cylinder. Then draw the straight lines C C' and D D', which are tangents to both ellipses.

EXERCISE III.—Model Drawing from the Solid.

3

ONE AND CYLINDER. — This page is to be used for drawing the cone and the cylinder from the solid model. *The Cone*, for the left half of the page. — The teacher will place a cone within sight of all the pupils, and above the eye, with its axis vertical and its base visible. The pupils should draw the axis first, then the circular base, which will appear elliptical, and lastly, the straight lines forming the sides, from the apex tangential to the ellipse.

The Cylinder, to be drawn in the right half of the page. — The teacher will place a cylinder in view of all the pupils, and above the eye. The pupil should turn back to page 1 and see how the cylinder was there drawn in Fig. 2. — Notice that in this exercise the base of the cylinder is visible, and that the upper ellipse should be rounder than the lower, — just the reverse of the forms of the ellipses in Fig. 2.

EXERCISE IV.—Objects to be completed.

4
Fig. 5. A GREEK VASE.—The left half of a vase is drawn correctly; the pupil is to draw the right half. Begin by drawing the horizontal guide-lines as far to the right as they extend to the left. Then draw the ellipses, and last the profile.

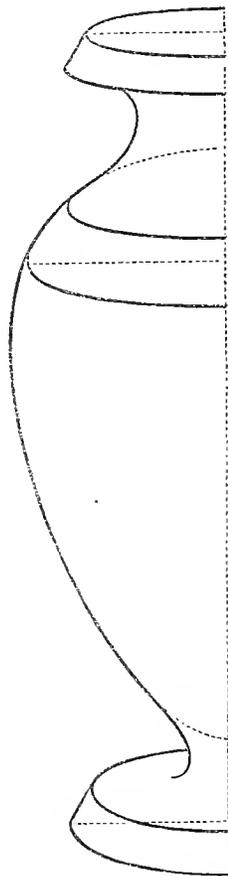


Fig. 5. — Greek Vase.

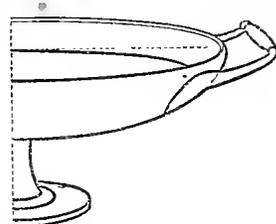


Fig. 6. — Greek Tazza.

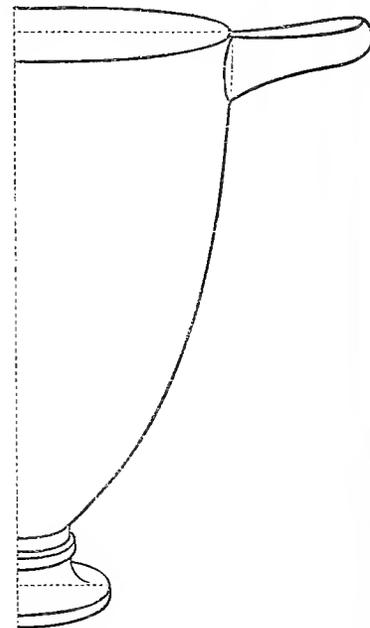


Fig. 7. — Greek Vase.

Figs. 6 and 7. A GREEK TAZZA AND VASÉ.—Here the right halves are drawn; the pupil is to draw the left half of the two forms.

EXERCISE V. — Drawing from Objects.

5

The teacher will place in view of the pupils a large white bowl, or some similar object, to be drawn on the left half of the page. It should be so placed that all the pupils can see into it slightly, thus making the circular top appear as a narrow ellipse. The teacher should first sketch the general appearance of the object on the board and then let the pupils draw it. For the second half of the page provide a pitcher with simple outlines, or a common glass bottle.

The pupils should notice that the objects placed before them are symmetrical in general form. Accordingly draw a central line to begin with. Observe that all the circular forms in the objects appear as ellipses. Settle the width of the ellipses by points on the diameters, and then draw the elliptical curves. Look at page 19 and see how the bowl is there drawn.

EXERCISE VI.—Vases to be completed.

Figs. 8, 9, and 10. GREEK VASES.—The exercises on this page are to teach the drawing of lines on vases. The right halves to be drawn so as exactly to balance the left halves.—The teacher should point out and illustrate on the board that the ellipses should always be tangential to the profile, not cutting across it.

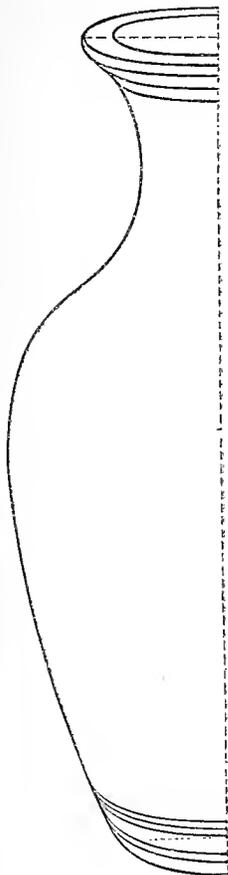


Fig. 8.—Vase.

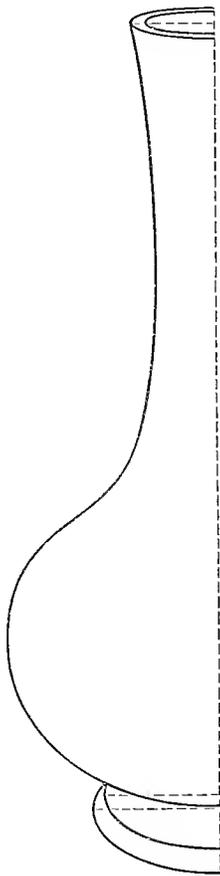


Fig. 9.—Vase.

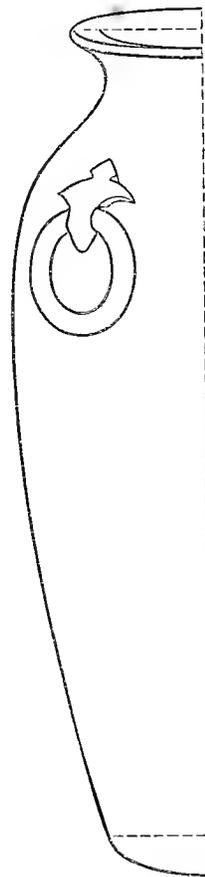


Fig. 10.—Vase.

Draw the horizontal lines completing the long diameters of the ellipses, first, and then draw the ellipses themselves.—Add the profiles of the vases, noticing where the widest and narrowest parts occur.

EXERCISE VII.—Drawing from Objects.

7

This page should be used for drawing from vases, or from any symmetrical forms in glass or pottery. The teacher should require the pupils to divide the page into two or three equal parts according to the number of objects to be drawn, and select such forms as will fill the spaces agreeably. If the forms are higher than their width, three may be placed on the page. If no suitable object can be procured, require pupils to draw two previously drawn vases from memory.

The pupils, having seen how to draw the half of a vase on page 6 from a copy, may now try to draw the whole of one, in the same manner, from an object. Central line first, horizontal diameters of the ellipses next, and profile of vase last.

Fig. 11. GLASS GOBLET.—The goblet on this page is to be drawn, with the construction lines in the order of the numerals. See that 3 1, 3 4 are equal, and that 3 5 and 3 6 are also equal, before drawing the ellipse. The thickness of rim at 4 is slightly greater than at 1.

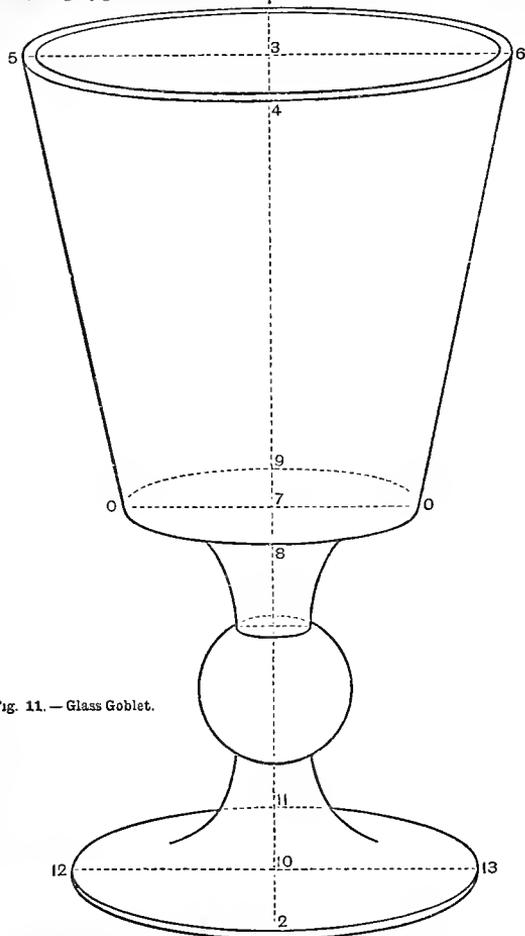


Fig. 11. — Glass Goblet.

Pupils should remember, no measuring is allowed before drawing. Measure only with your teacher's permission, and only then to *test* your work, not to save the trouble of trying to get the proportions right. Keep the same thickness of line everywhere, and always carefully erase the construction lines before finishing.

Fig. 12. EGG AND EGG-CUP. — The curve next in importance to the ellipse is the ovoid, or egg-shape. Here it is shown by an egg-form which appears partly above the egg-cup, and partly by the invisible or dotted lines in the cup. The two small diagrams show an ovoid curve in reversed positions.

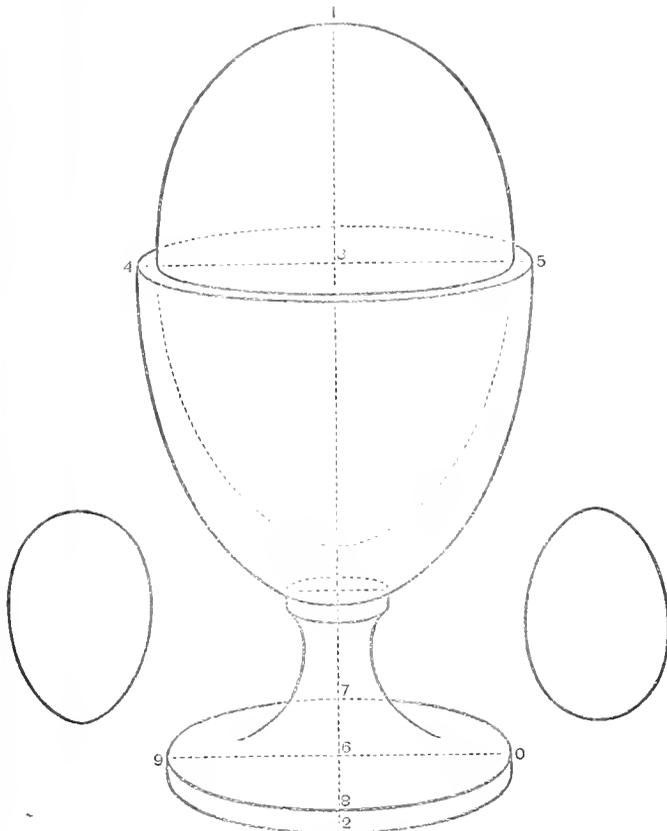


Fig. 12. — Egg and Egg-Cup.

Draw the central line and horizontal lines, following the order of the numerals. We have here a combination of the ovoid in the egg, and the ellipse in the top and bottom of the egg-cup. Notice that the ovoid shape is only symmetrical on its long axis, which is vertical in this example.

EXERCISE X. — Cubes and Oblong Block, or Parallelepipedon.

Figs. 13, 14, and 15. CUBES AND OBLONG BLOCK. — It is necessary here to learn this rule: "Parallel lines retreating from the eye appear to converge, or get nearer together." Fig. 13. — Draw 1 2, the nearest edge of the cube. Draw 1 3 toward the right, and 1 5 toward the left. Draw 2 4, 2 6, pointing upwards more than 1 3, 1 5, so as to make 3 4 shorter than 1 2, and 5 6 shorter than 3 4.

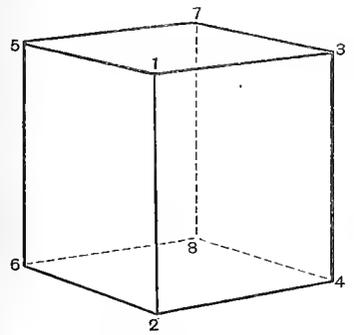


Fig. 13. — Cube.

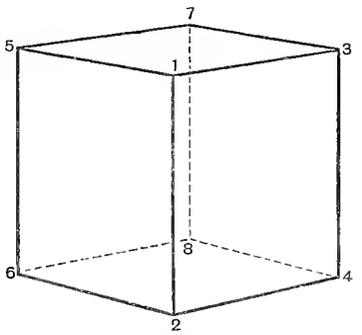


Fig. 14. — Cube.

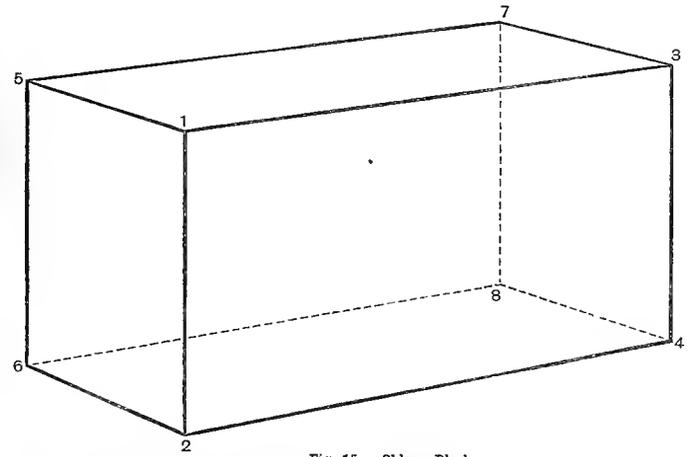


Fig. 15. — Oblong Block.

Draw the second cube Fig 14 and the oblong block in the same order as the first cube, always remembering the above rule, that parallel lines retreating from the eye appear to converge.

Figs. 16, 17, and 18. CHAIR, BOX, AND TABLE.—Here the forms of the cubes and parallelepipedon of page 10 are converted into objects. Draw the cubes on a smaller scale than on page 10, and the block of exactly the same size. This should be one lesson, leaving the lines tant.

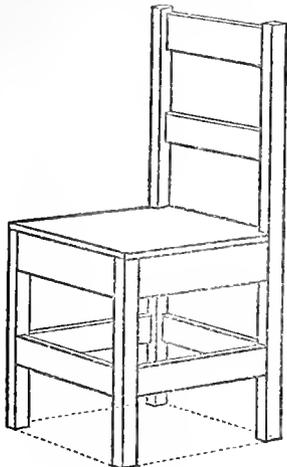


Fig. 16.—Chair.

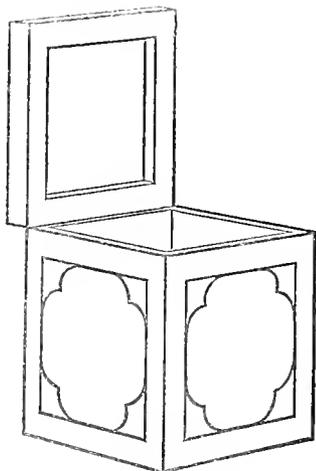


Fig. 17.—Box.

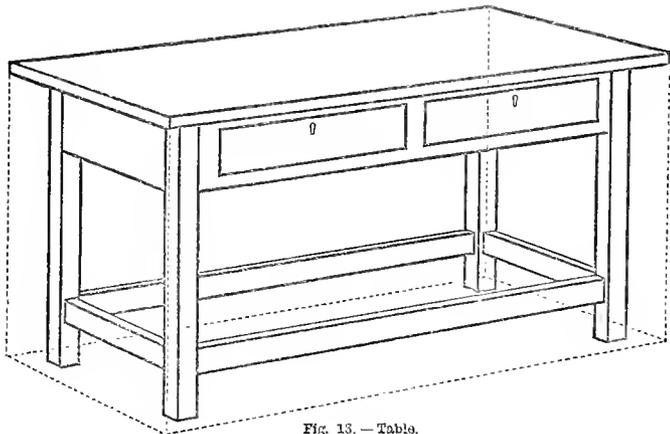


Fig. 18.—Table.

For the next lesson, beginning with the chair, draw the front legs and back, and back legs, at the angles of the cube, the size of the copy. Then the rails joining the legs and the bars of the back and below the seat. Follow the same order in the box and table.

EXERCISE XII.—Ewer and Cube.

Fig. 19. EWER AND CUBE. — We have here two objects grouped together, illustrating the two principles to be remembered in model drawing, viz. that a circle seen obliquely appears as an ellipse, and that parallel lines going away from the eye appear to get nearer together as they retreat.

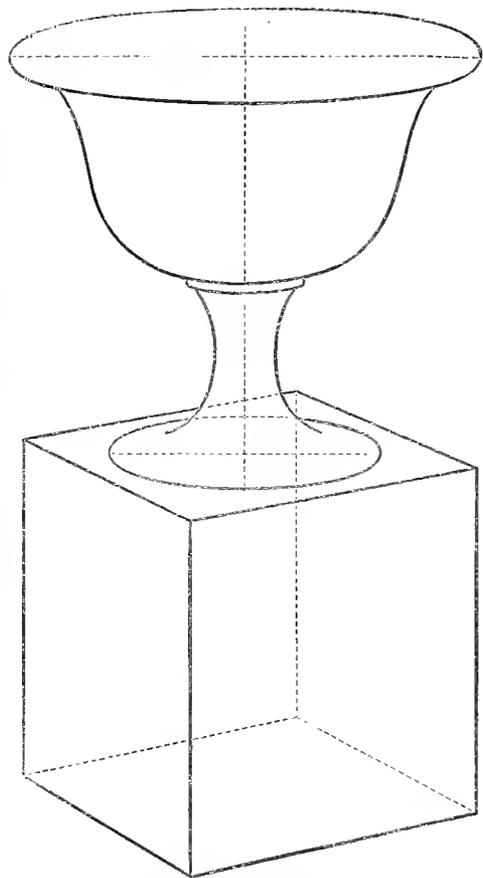


Fig. 19. — Ewer and Cube.

Draw the central line of both solids first, the upper one being symmetrical, the lower one showing the right side widest. Follow directions as previously given in drawing similar objects.

EXERCISE XIII.—Drawing from Solid Models.

CUBE AND OBLONG BLOCK FROM THE SOLIOS.—The teacher will place a cube in view of the pupils, to be drawn in the left-hand half of the page, and illustrate several views of the cube on the blackboard as a guide to the pupils. For a model to fill the right half of the page, place the oblong block standing on its square base, and at a different angle to the pupils from that of the cube.

EXERCISE XIV.—Cone, Cylinder, and Square Plinth combined.

Fig. 20. CONE, CYLINDER, AND SQUARE PLINTH. — Draw the lines in the order of the letters, and the curves through the points indicated by the letters.

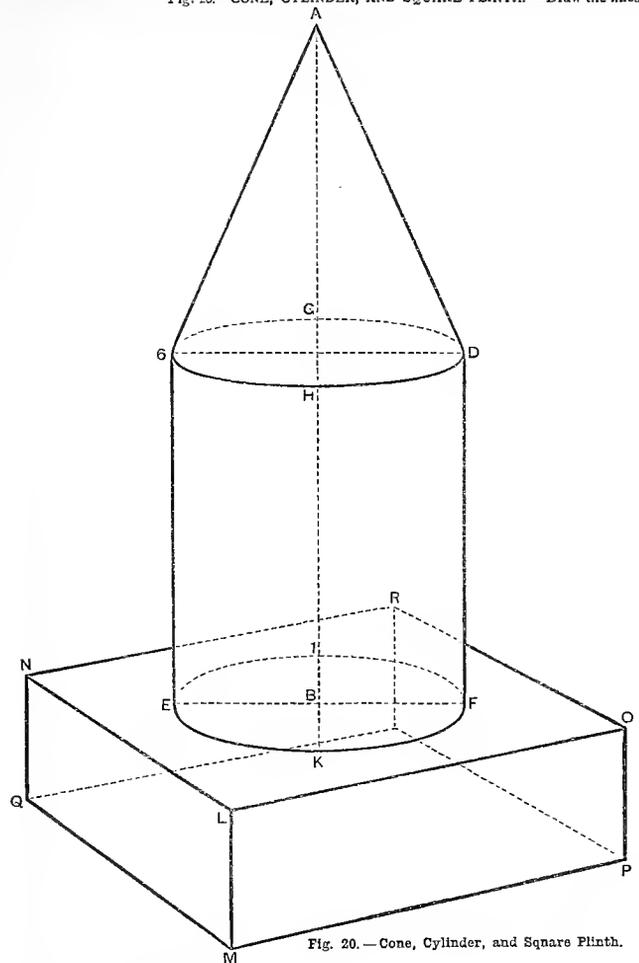


Fig. 20.—Cone, Cylinder, and Square Plinth.

The square block on which the cylinder rests is called a plinth. Draw the cone and cylinder first, and then the plinth. The lines L M, L O, L N to be drawn in order of letters, and the parallel lines L O, M P to converge or get nearer together, and also the lines L N and M Q.

EXERCISE XV.—Drawing from Objects.

FOR AN APPLE AND LEMON, DRAWN FROM NATURE.—The teacher should require each pupil to bring an apple to school to draw on the first half of this page, and a lemon or orange for the second half. In drawing the apple, show its eye, and its stalk if there be one. The fruit should be placed on the desk in front of each pupil, and be drawn of the real size.

The pupil should draw the shape of the outer line, or outline of the fruit, first, and then mark, in their places, the eye or stalk. Any marks on the surface of the apple and lemon must be drawn lighter than the outline.

EXERCISE XVI.—Earthenware Mug.

Fig. 21. EARTHENWARE MUG. — Draw the lines 1 2, 3 4, 5 6 in the order given, and the straight outlines between 3 5 and 4 6. When the body of the mug and ellipses on it are right, draw the handle.

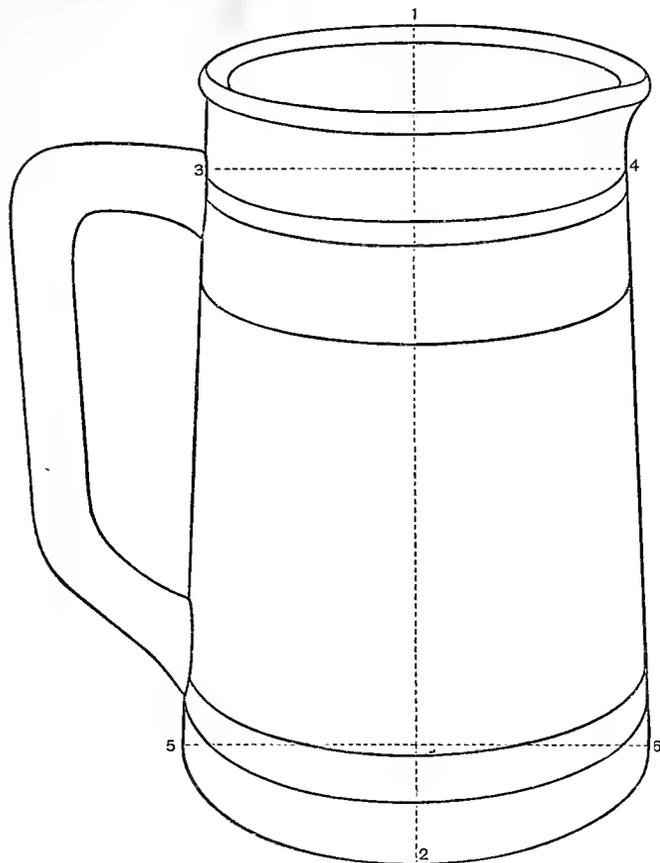


Fig. 21. — Earthenware Mug.

Notice that where the handle joins the outline of the mug at 3 and above 5, the straight outline of the mug is hidden, the joining of the handle with it bringing the lines to the right of 3 5.

EXERCISE XVII.—Earthenware Pitcher.

Fig. 22. EARTHENWARE PITCHER. — The pitcher is to be drawn the same size as the copy. The ellipses on the neck and body will give an opportunity to show delicate and accurate drawing.

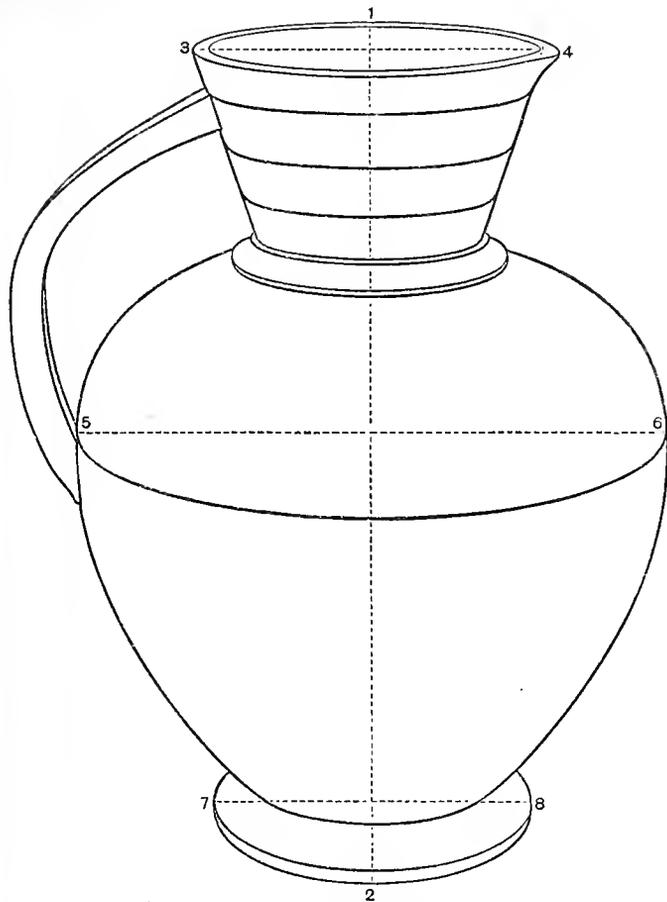


Fig. 21. — Earthenware Pitcher.

Follow the order of the numerals. Make the two sides of the neck and body of the pitcher symmetrical first, and then add the spout and handle.

EXERCISE XVIII.—Silver Mug and Square Block.

Fig. 23. SILVER MUG AND SQUARE BLOCK.—The elliptical top and bottom, and the straight sides of the mug to be first drawn, and then the square block on which it stands; lastly the handle of the mug.

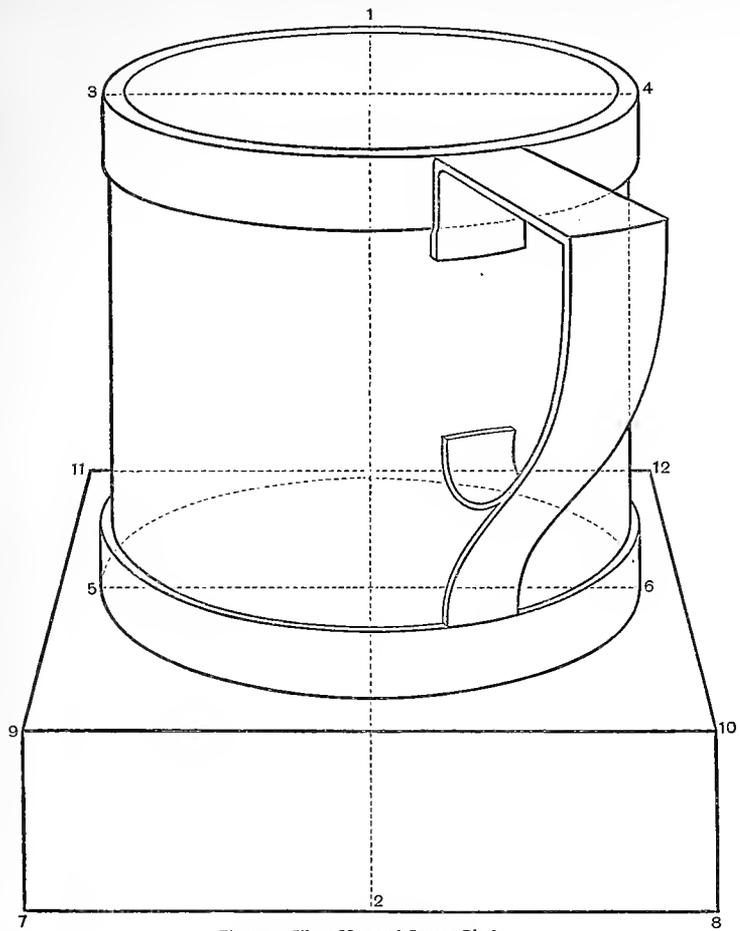


Fig. 23. — Silver Mug and Square Block.

Better to spend two lessons over this exercise, in order to get the handle well drawn. The handle will be enough for one lesson, if carefully executed.

Fig. 24. BOWL, AND BOOK WITH CLASP.—Let the bowl be drawn first, and all its ellipses be completed. Then the book should be drawn as if it were a block, similar to the one on page 18: the thickness of the cover, and the clasp added afterwards.

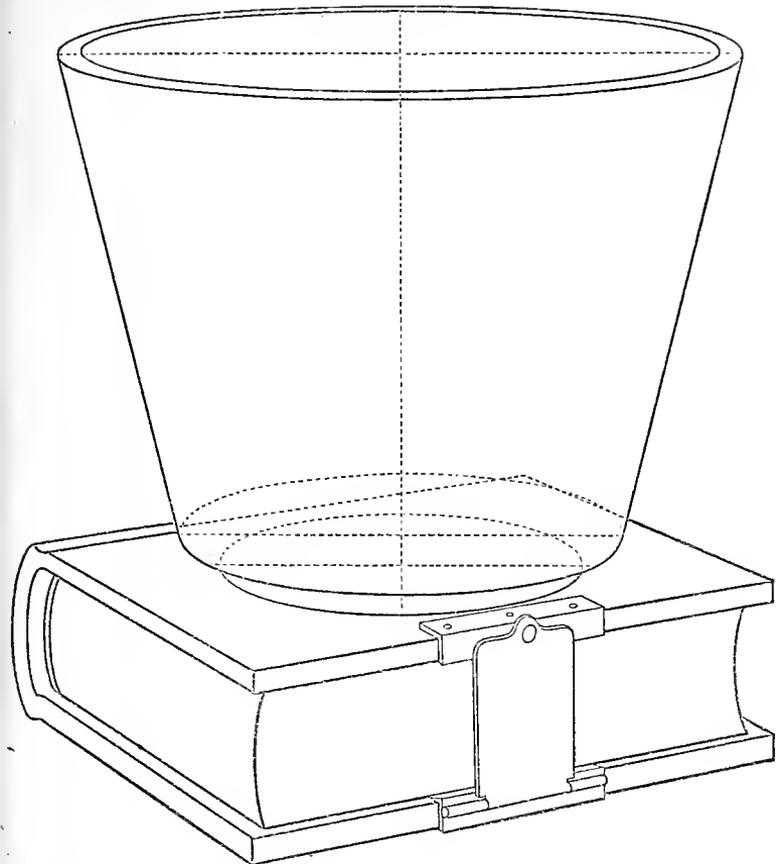


Fig. 24.—Bowl, and Book with Clasp.

Learn, by drawing with accuracy the simple objects given you, how to draw more elaborate subjects in more difficult positions, when you may be required to do so.

EXERCISE XX.—Drawing from Objects.

TEACUP AND SAUCER, ON A BOOK.—To finish this course of lessons, let the teacher place one or more groups consisting of a teacup and saucer on a book, so that every pupil can see one group without interruption. Let the drawing be on a large scale, to fill the page. The book should be about twice the width of the saucer, and about half as thick as the teacup is high.

Let the pupils show, by their skill in drawing these objects, what they have learned about drawing from objects.

ELEMENTARY PRINCIPLES TO BE TAUGHT AND OBSERVED IN MODEL AND OBJECT DRAWING: FREEHAND.

MODEL AND OBJECT DRAWING is the freehand representation of individual objects as they appear to the eye when looking at the solid or natural form. In model drawing the pupil must be taught to look for the geometric basis of forms, regular or irregular. It is well, therefore, to begin with the drawing of the geometric solids which will form the first exercises. In this book they are: 1. The cone; 2. The cylinder; 3. The cube; 4. The parallelepipedon, or oblong block; 5. The square plinth. All the other forms in the book are irregular variations from these.

These solids should be shown to the pupils and their characteristics explained before they are drawn, the teacher illustrating the definitions by ample illustrative sketches on the board.

RULES TO BE OBSERVED.

I. A circle seen oblique to the plane of its surface appears an ellipse.

II. Parallel lines retreating from the eye appear to converge.

These principles, understood and complied with, will enable the pupil to approximate to accurate work.

Let the teacher revolve the cone with its axis in a vertical plane, and with the base more or less oblique to the views of the pupils, to show the different ellipses which the same circle may become apparently. In drawing the cone and cylinder, remember that the long diameters of their bases will always be perpendicular to their axes.

In drawing the rectangular solids remember that

I. Vertical lines are always drawn vertical, and therefore parallel.

II. Two equal lines running in the same direction but at unequal distances from the eye will appear unequal in proportion to their distances from the eye, the farthest being the shortest.

III. Horizontal lines above the level of the eye, and retreating from it appear to point downwards; if below the level of the eye, they appear to point upwards, and must be so drawn.

IV. If any two points in a horizontal line (or the line produced) are at equal distances from the eye, the line must be drawn horizontally.

MEASURING THE SOLID.

The larger proportions, as of width to height, in a solid form may be approximately measured by use of the pencil or scale, held at the full extent of the arm's reach, in this way: if the form be a cylinder, hold the pencil between the thumb and first finger horizontally, and as far as the arm will reach, observing how much of the pencil is taken by the width of the cylinder; with the arm and eye in the same position, measure how many times the width can be measured up the height, from the base upwards. If it measures twice, then the cylinder will be in height twice its width.

But the larger proportions of a solid or natural object having been settled, the smaller ones must be judged by the eye, these being compared with dimensions already determined. In drawing the circle, seen as an ellipse, the shorter diameter should be measured along the longer, to see the proportion of the two, and these proportions must be kept in the drawing.

Practice only will enable the pupil to make these measurements truly, but all pupils should be taught to observe the comparative sizes of different parts of an object, and try to express this difference in their drawings. Let the first direction to a class commencing to draw from the solid be, "Compare the width with the height; which is the greater?" and this being determined rightly, proceed with minor characteristics.

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PREPARED BY PROF. WALTER SMITH,

State Director of Art Education for Massachusetts, General Supervisor of Drawing in the Boston Public Schools, and Director of the Massachusetts Normal Art School.

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